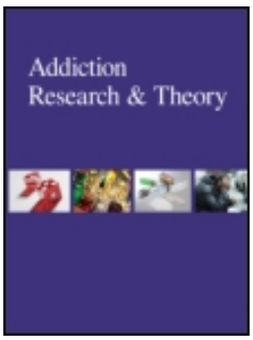

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Does consideration of future consequences moderate the relationship between aggression and alcohol use in adolescents? Results from the United Kingdom

Michael Thomas McKay[1], Martin Dempster[2], and Zena Mello[3]

[1]Centre for Public Health, Liverpool John Moore's University, Liverpool, UK, [2]School of Psychology, Queens University, Belfast, UK, and [3]Developmental Psychology, San Francisco State University, San Francisco, CA, USA

Abstract

Background: An increasing body of literature suggests that those who give greater consideration to the future consequences (CFC) of their present behaviours are at a reduced risk of negative health outcomes. However, it remains unclear to what degree consideration of immediate or long-term consequences are important. The present study examined whether higher CFC (immediate and future) scores moderated the relationship between trait aggression and self-reported alcohol use in a large sample of adolescents in the United Kingdom. *Methods*: Participants were 1058 adolescents from Northern Ireland. Participants completed questionnaires assessing Anger, Hostility, Verbal Aggression, Physical Aggression, Consideration of Future Consequences, and alcohol use. *Results*: Results revealed that higher CFC immediate and CFC future both significantly moderated the relationship between higher trait aggression and higher self-reported alcohol use, but only for females. *Conclusions*: This finding adds to the increasing body of literature examining the relationship between temporal orientation and health-related outcomes. However, more work is needed to help untangle the gender-specific effects.

Keywords

Aggression, alcohol, consideration of future consequences, moderation introduction

History

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Introduction

Health behaviour generally is characterised by immediate effort (e.g. going on a diet) for possible but uncertain future gain (e.g. weight loss; Piko, Luszczynska, Gibbons, & Tekozel, 2005; Orbell & Hagger, 2006). Because health benefits are generally delayed in time, perceived benefits are also likely to be delayed. Moreover, the uncertainty of a potential health benefit (e.g. weight loss) stands in contrast to the certain pleasure to be derived from immediate behaviour (e.g. eating chocolate). This same trade-off applies to alcohol use where the guaranteed and often pleasurable immediate consequences stand in contrast to potential, but uncertain long-term benefit from abstinence.

Research has identified individual differences in the tendency to focus on the present (or immediate consequences) versus the future (or long-term consequences; Bushman, Giancola, Parrott, & Roth, 2012). The temporal construct known as Consideration of Future Consequences (CFC; Strathman, Gleicher, Boninger, & Edwards, 1994) describes the extent to which people consider the potential distant outcomes of their current behaviours and the extent to which they are influenced by these potential outcomes. Although the construct is studied and discussed within the broader area of time perspective, it represents something more specific than a general preoccupation with the future. CFC involves a simultaneous assessment of present actions and future outcomes; whereas future time perspective (e.g. Zimbardo & Boyd, 1999) might be considered a more general orientation toward a time period, rather than the relationship between the present and the future. Thus, although the outcome is in the future, the action, or decision to act is happening in the present. Higher CFC is significantly associated with behavioural self-regulation, self-control, conscientiousness and delay of gratification (Strathman et al., 1994). Individuals higher in CFC have been shown to be less aggressive and impulsive (Joireman, Anderson, & Strathman, 2003), less likely to engage in aggressive driving (Moore & Dahlen, 2008), impulsive buying (Joireman, Sprott, & Spangenberg, 2005), compulsive buying (Joireman, Kees, & Sprott, 2010), and are more likely to financially plan for the future (Webley & Nyhus, 2006). A growing body of literature suggests that those higher in CFC are also less likely to engage in health-compromising behaviours and generally live more healthy lifestyles. Accordingly, individuals high in CFC have been found to be more likely to exercise frequently (Ouellette, Hessling, Gibbons, Reis-Bergan, & Gerrard, 2005), sleep better (Peters, Joireman, & Ridgway, 2005), be more likely to engage in safer sexual behaviour (Appleby, Marks, Miller, Murphy, & Mansergh, 2005), to participate in

Correspondence: Dr Michael Thomas McKay, Centre for Public Health, Liverpool John Moore's University, Liverpool, UK. E-mail: M.T.McKay@ljmu.ac.uk

health screening (Orbell & Hagger, 2006), drink less problematically (Beenstock, Adams, & White, 2011; Bushman et al., 2012), and to have lower levels of obesity and to smoke less (Adams & Nettle, 2009).

There has been an on-going debate over the factor structure of the Consideration of Future Consequences Scale (CFCS; Strathman et al., 1994). Originally, the CFCS was viewed as a unidimensional scale concerned with future consequences. However, Joireman, Balliet, Sprott, Spangenberg, and Schultz (2008), Joireman, Shaffer, Balliet, and Strathman (2012) and others have suggested that there is conceptual utility in viewing the scale as consisting of two underlying factors measuring either concern with immediate consequences or with the future. Accordingly, Joireman et al. (2008) described and evidenced two-factors, CFC-Immediate (CFC-I; concern with immediate consequences) and CFC-Future (CFC-F; concern with more distant future consequences). Conceptually, then, it may be beneficial to differentiate between the CFC-F and CFC-I subscales, especially if one is interested in whether individuals are being affected by consideration of both immediate (or present) and future consequences. Analyses using both CFC-F and CFC-I allow researchers to examine the degree to which it is short- or long-term consequences that are important. This subtle difference is important and might have practical implications. For example, if a clinician believes drinking is due to a failure to consider future consequences, interventions should aim to enhance the drinker's concern with those future consequences. Alternatively, if a clinician believes drinking is due to a high concern with immediate consequences, perhaps akin to hedonism (McKay, Andretta, Magee, & Worrell, 2014), interventions might be better aimed at reducing the attractiveness of immediate consequences, for example by reconceptualizing the ''hot (immediate) stimuli'' associated with drinking in less favourable terms. By merging the immediate and future items into a single CFC score, a researcher could be overlooking an important conclusion: reduced drinking is not driven by a concern with future consequences (e.g. long-term health benefits) but rather by a concern with immediate consequences (e.g. playing sport next day).

In their article on CFC, ego depletion, and self-control, Joireman et al. (2008) articulated two competing theoretical models based on the distinction between CFC-Immediate and CFC-Future subscales. Essentially, the *susceptibility model* assumes that a high level of CFC-Immediate makes one susceptible to self-control failure, whereas the *buffering model* assumes that a high level of CFC-Future buffers one against self-control failure. Support for a two-factor distinction and the value of the susceptibility and buffering models has been offered elsewhere (Joireman et al., 2008; Rappange, Brouwer, & Van Exel, 2009). Research has shown that those scoring high on the CFC-Future subscale are more likely than those scoring low on the CFC-Future subscale to forgo smaller, certain rewards in favour of larger but less certain rewards (see, for example, Joireman et al., 2012), consistent with the idea that CFC-Future is associated with a tendency to focus on ''pursuing (uncertain) gains.'' Similarly, research has shown that those scoring high on the CFC-Immediate subscale are more likely to opt for smaller, immediate rewards over larger, delayed rewards (Joireman et al., 2008), consistent with the idea that CFC-Immediate is associated with a tendency to focus on ''preventing (immediate) losses.''

The present study sought to examine how CFC-I and CFC-F scores related to alcohol use and aggression scores (main effects), and to what degree (if any) CFC moderates the relationship between alcohol use and aggression.

The relationship between alcohol use and aggression is important to examine in adolescents as it helps us to understand the relationship between alcohol use and health in adolescence as a means of predicting adult consumption. Despite a large amount of research in the area, it has been suggested that evidence for a direct causal relationship between adolescent drinking and its impact on adult health is inconclusive (McCambridge, McAlaney, & Rowe, 2011). The complexity of the relationship between earlier alcohol use and later problems appears to be confounded by, for example, problem behaviours and/or behavioural disinhibition, such as aggression (e.g. Donovan & Molina, 2011); and some have concluded that earlier initiation is better characterised as a marker of risk, rather than a causal influence. Indeed, Rossow and Kuntsche (2013) concluded that earlier onset drinking was not responsible for later heavy drinking, except as part of a wider array of conduct problems.

A large body of research has supported the hypothesis that childhood aggression typically precedes substance use (e.g. Fothergill & Ensminger, 2006; Juon, Doherty, & Ensminger, 2006; Pardini, White, & Stouthamer Loeber, 2007). Cross-sectional studies have also supported the relationship between aggression and alcohol use. For example, Tremblay and Ewart (2005) reported that physical aggression (but not verbal aggression, anger or hostility) was significantly associated with number of drinks per occasion and frequency of heavy episodic drinking in university undergraduates. Using a latent class analysis, Percy and Iwaniec (2010) reported that behavioural under-control was a key predictor of adolescent drinking patterns across all types of drinking with the exclusion of the higher end drinking where there were no differences between heavy and hazardous drinkers on behavioural under-control indicators.

In a recent laboratory study examining the relationship between CFC, aggression and acute alcohol consumption, Bushman et al. (2012) showed that intoxicated individuals were more aggressive than sober individuals, and that CFC was negatively related to aggression – but actual rather than self-reported aggressive behaviour. In fact, by far the most aggressive participants in the present study were intoxicated individuals who tended to ignore future consequences. Individuals who considered future consequences tended to be nonaggressive, regardless of whether they were intoxicated or sober. The *General Aggression Model* (Anderson & Bushman, 2002) posits that there are two types of input variables that can influence aggression: personal and situational. Personal variables in this case would include gender and CFC, while situational variables would include alcohol use and aggressive cues, and how these could influence aggression. Both alcohol use and CFC are biologically related to prefrontal cortex functioning (Bushman et al., 2012) and the General Aggression Model proposes that both alcohol consumption and CFC are input variables that can influence appraisal and decision processes. Individuals who tend to think about the

potential future consequences of their actions may be more likely than others to engage in thoughtful, effortful reappraisal of situational events (Anderson & Wood, 2005). Situational variables may also influence appraisal and decision processes. Decisions and appraisals influence whether people behave in a thoughtful, nonaggressive manner or in an impulsive, aggressive manner (Bushman et al., 2012).

Additionally, it is important to recognise that research in both CFC and aggression has produced inconsistent results in terms of gender. Beenstock et al. (2011) reported a statistically significant difference in CFC between male and female undergraduates, with women scoring significantly higher than men, supporting findings using this measure elsewhere (Pertocelli, 2003). Orbell and Hagger (2006) found no significant sex differences in scores in CFC, while, in an adolescent sample, Rappange et al. (2009) reported no sex differences when the 12-item CFC Scale was used. However, these authors concluded that girls showed a higher CFC when the construct was framed in present-oriented statements and boys when it was framed in future-oriented statements. In another Dutch sample, sex, age, and income were related to CFC score in univariate analyses, but in a joint analysis the effects of sex on CFC became insignificant (Toepoel, 2010). Inconsistent results have also been observed with regard to the aggression literature. For example, in a one-year follow-up study, Skara et al. (2008) examined physical aggression, relational aggression (deriding, excluding, or lying about a peer) and 4 types of drugs used (alcohol, cigarettes, marijuana and hard drugs). Only physical aggression predicted alcohol use, and for males only (i.e. the effect was moderated by gender). Relational aggression was moderated by gender so that it predicted later cigarette and marijuana use for females. Relational aggression predicted alcohol and hard drug use for males and females.

Building on this extensive literature, and extending the work of Bushman et al. (2012) to include a more detailed examination of trait aggression, the present study sought to investigate the relationship (main effects) between CFC, four domains of aggression, and alcohol use in adolescents, and further, the extent (if any) to which CFC-I (''susceptibility'') and/or CFC-F (''buffering'') moderate the relationship between adolescent trait aggression in these four domains and adolescent alcohol use. Further, it sought to contribute toward the vastly inconsistent research on gender differences in the relationship among CFC, aggression, and alcohol use.

Drawing from this literature, the current study sought to make several contributions. First, we aimed to extend the work of Bushman et al. (2012) by including a more detailed examination of trait aggression in four domains and by examining their relationship with CFC and alcohol use in adolescents. Second, we compared CFC-immediate (susceptibility) and CFC-future (buffering) in moderating the relationships between aggression and alcohol use. Third, we sought to address the inconsistencies in findings related to gender by considering males and females separately.

Methods

Sample

Participants were school children ($n = 1058$) from 12 High schools in the Greater Belfast Area in Northern Ireland (NI). A total of 1106 school children had been recruited, although 48 respondents were eliminated as their completed questionnaires were disqualified given that these cases endorsed both ''*very untrue of me*'' and ''*very true of me*'' response options. Schools were randomly chosen to reflect the overall demographics of the area and all schools approached agreed to participate. Schools were asked to provide between 20 and 25 pupils from each of school grades 8–12 (ages 12–16). The study received ethical approval from the Ethics Committee at the University of Liverpool.

Measures

The Consideration of Future Consequences Scale (CFCS; Strathman et al., 1994) is a 12-item scale made up of five positively worded items and seven negatively worded items. Responses were on a 5-point Likert-type scale from 1 (*very unlike me*) to 5 (*very like me*). As in other studies (e.g. Joireman et al. 2008), in this study, the positively worded items were summed to yield a CFC-F (future) score, indicating active consideration of future consequences. The negatively worded items were reverse-scored and were summed to yield a CFC-I (immediate) score, so that CFC-I score reflects active consideration of immediate consequences. Strathman et al. (1994) reported internal consistency estimates for CFCS scores in college student samples ranging from 0.80 to 0.86, a 2-week test–retest reliability coefficient of 0.76, and a 5-week test-retest reliability coefficient of 0.72 ($\alpha_{\text{current study}} = 0.71$ for CFC-F and 0.78 for CFC-I).

The Aggression Questionnaire (AQ; Buss & Perry, 1992) consists of 29 items that represent the subscales of the questionnaire: (1) Physical aggression, (2) Verbal aggression, (3) Anger and (4) Hostility. Internal consistency reliability reported by Buss and Perry (1992) was as follows: Physical Aggression, (Cronbach's $\alpha = 0.85$; $\alpha_{\text{current study}} = 0.88$), Verbal Aggression $= 0.72$; $\alpha_{\text{current study}} = 0.71$, Anger $= 0.83$; $\alpha_{\text{current study}} = 0.83$, Hostility $= 0.73$; $\alpha_{\text{current study}} = 0.69$, indicating adequate internal consistency (Buss & Perry, 1992). Test–retest coefficients were also found to have acceptable reliability (Buss & Perry, 1992).

The Adolescent Alcohol Involvement Scale (AAIS; Mayer & Filstead, 1979) is a 14-item self-report screening measure for alcohol abuse in adolescents. In respect of alcohol research, it serves to help identify adolescents whose alcohol use impacts adversely on psychological functioning, social relations and/or family life. Questions are answered on a Likert scale allowing for a highest possible score of 79. The scale has demonstrated good psychometric properties and in a meta-analysis of adolescent alcohol screening measures, Shields et al. (2008) reported that among AAIS-administered samples made up of at least 80% Caucasians, the average reliability estimate was 0.86 ($\alpha_{\text{current study}} = 0.81$).

Procedure

Data were gathered under examination-like conditions. Participants were issued with a set of response sheets and all questionnaires were administered verbally by the researcher, allowing pupils with literacy difficulties to take part and also to help maximise the number of fully completed

response sheets. This meant that those with reading difficulties did not have to read the questions, and afforded all participants the opportunity to ask for clarification on any of the questions asked. Data collection took approximately 30 minutes in each school. An ''opt out'' passive consent, approved by the University of Liverpool Ethics Committee, ensured that parents received detailed information on the study and were only required to respond if they were unhappy about their child's participation. On the day of the data collection, each participant gave their own informed consent to be involved.

Analyses

Firstly, independent samples *t*-tests were computed in order to examine sex differences on dependent measures. Additionally Pearson's correlations (two-tailed) were computed to examine the relationship between dependent measures. Finally, tests of moderation were computed using the Andrew Hayes PROCESS download for SPSS (see www.afhayes.com). Moderation examines the degree to which the size or nature of the relationship between a predictor variable (X) and an outcome variable (Y) changes as a function of a moderator (M). In the present study the predictors were the AQ subscale scores and sex, the outcome was score on the AAIS, and the moderators were CFC-I and CFC-F scores. Tests of moderation were subsequently conducted separately for the males and females in the sample. All analyses were performed using SPSS V.20.

Results

Table 1 displays the means, standard deviations and results of independent samples *t*-tests for sex and dependent measures. Results show that males scored significantly higher on measures of CFC-F, physical and verbal aggression, with moderate to large effect sizes. Females scored significantly higher on CFC-I, although the effect size was small. There was no significant difference between males and females in respect of anger, hostility or AAIS score.

Table 2 displays the results of Pearson's correlations between measures. Where there were significant correlations between CFC or AAIS score and measures of aggression, the coefficients were generally ''small'' ($\leq$.3) in nature (Cohen, 1988).

In order to examine the relationship between sex, aggression and CFC, a series of hierarchical linear regression models were computed examining predictors of AAIS scores. AAIS scores were entered as the dependent variable, sex was entered at step one, and CFC and aggression scores entered at step two. A total of eight separate models were then computed. In each model a three-way interaction term (sex $\times$ aggression domain $\times$ CFC domain) was entered at step three. Step three (and the final model) was significant only in the case of physical aggression, indicating that the interaction between sex, physical aggression and CFC-I and CFC-F provided a significant increase in the variance in AAIS score as explained by the model. Specifically the following were the step 3 and final model statistics for physical aggression: CFC-I ($\Delta R^2 = 0.01$, $\Delta F = 12.06$, $p = 0.001$) and $F(4,_{1053}) = 45.88$, $p < 0.001$, indicating that the interaction between sex, physical aggression and CFC-I ($\beta = -0.34$, $t = -3.47$, $p = 0.001$) provided a significant increase in the variance in AAIS score; CFC-F ($\Delta R^2 = 0.01$, $\Delta F = 11.84$, $p = 0.001$) and $F(4,_{1053}) = 41.36$, $p < 0.001$, indicating that the interaction between sex, physical aggression and CFC-F ($\beta = -0.35$, $t = -3.44$, $p = 0.001$) provided a significant increase in the variance in AAIS score.

On the basis of the results of these exploratory analyses, a number of more detailed sex-specific analyses were undertaken. Tests of moderation were performed for each of the aggression domains (anger, hostility, physical and verbal aggression) and for each of the CFC subscales. Results revealed no significant moderation by CFC-I or CFC-F subscales in the relationship between aggression and AAIS score among males. In sharp contrast, among females, CFC-I and CFC-F were shown to moderate aggression and alcohol use. Table 3 displays the results of tests of moderation in females.

CFC-F

Unlike the other domains of aggression, results showed no significant moderation effect of CFC-F on the relationship between anger and AAIS score. Results indicated that lower CFC-F and higher hostility were both significantly associated with higher AAIS score. CFC-F $\times$ hostility was also significant ($\beta = -0.10$, $p < 0.01$), suggesting that the effect of hostility on AAIS score is moderated by CFC. Simple slopes for the association between hostility and AAIS score were tested for low (-1 SD below the mean), moderate (mean), and high (+1 SD above the mean) levels of CFC-F. Simple slopes analyses were only significant for moderate ($\beta = 0.64$, $p < 0.001$) or low ($\beta = 0.98$, $p < 0.001$) levels of CFC-F, but not for high levels ($\beta = 0.31$, $p = 0.07$). Lower CFC-F and higher verbal aggression were significantly associated with higher AAIS score. CFC-F $\times$ verbal aggression ($\beta = -0.21$,

Table 1. Descriptive data and independent samples *t*-tests for variables measured. Shown are means (+ standard deviation).

	Males ($n = 543$)		Females ($n = 515$)				
	Mean	*SD*	Mean	*SD*	*t*-Test	*p* Value	Cohen's d
CFC-I	20.47	4.52	21.41	4.46	-3.40 (df_{1056})	0.001	-0.21
CFC-F	17.27	3.36	16.23	3.42	4.94 (df_{1056})	0.000	0.31
Anger	22.16	5.77	21.74	5.69	1.19 (df_{1056})	0.234	0.07
Hostility	22.73	5.09	23.12	5.39	-1.22 (df_{1056})	0.223	-0.07
Verbal Aggression	15.67	3.09	14.61	3.14	5.53 (df_{1056})	0.000	0.34
Physical Aggression	28.78	7.37	23.50	7.98	11.19 (df_{1056})	0.000	0.69
AAIS score	23.19	18.17	23.72	18.97	-0.47 (df_{1056})	0.642	-0.03

$p < 0.01$) was also significant. Simple slopes analyses were significant for low ($\beta = 2.33$, $p < 0.001$), moderate ($\beta = 1.63$, $p < 0.001$) and high ($\beta = 0.93$, $p < 0.01$) levels of CFC-F. Finally, lower levels of CFC-F and physical aggression were significantly associated with higher AAIS score. CFC-F × physical aggression ($\beta = -0.07$, $p < 0.01$) was also significant. Simple slopes analyses were significant for low (0.93, $p < 0.001$), moderate ($\beta = 0.68$, $p < 0.001$) and high ($\beta = 0.43$, $p < 0.01$) levels of CFC-F.

CFC-I

Results indicated that lower CFC-I and higher anger were both significantly associated with higher AAIS score. CFC-I × anger was also significant ($\beta = -0.05$, $p < 0.05$) suggesting that the effect of anger on AAIS score is moderated by CFC-I. Simple slopes analyses were significant for low ($\beta = 1.19$, $p<.001$), moderate ($\beta = 0.98$, $p < 0.001$) and high ($\beta = 0.77$, $p < 0.001$) levels of CFC-I. Results indicated that lower CFC-I and higher hostility were both significantly associated with higher AAIS score. CFC-I × hostility was also significant ($\beta = -0.08$, $p < 0.001$) suggesting that the effect of hostility on AAIS score is moderated by CFC-I. Simple slopes analyses were only significant for moderate ($\beta = 0.44$, $p < 0.01$) or low ($\beta = 0.80$, $p < 0.001$) levels of CFC-I, but not for high levels ($\beta = 0.08$, $p = 0.44$). Lower CFC-I and higher verbal aggression were significantly associated with higher AAIS score. CFC-I × verbal aggression ($\beta = -0.08$, $p = 0.05$) was also significant. Simple slopes analyses were significant for low ($\beta = 1.69$, $p < 0.001$), moderate ($\beta = 1.32$, $p < 0.001$) and high ($\beta = 0.95$, $p < 0.01$) levels of CFC-I. Finally, lower levels of CFC-I and physical aggression were significantly associated with higher AAIS score. CFC-I × physical aggression ($\beta = -0.04$, $p < 0.05$) was also significant. Simple slopes analyses were significant for low (0.74, $p < 0.001$), moderate ($\beta = 0.56$, $p < 0.001$) and high ($\beta = 0.38$, $p < 0.01$) levels of CFC-I.

Discussion

The present study examined the extent to which consideration of future consequences (CFC-F) and consideration of immediate consequences (CFC-I) moderated the relationship between four domains of aggression and composite alcohol use scores in a large sample of adolescents. Results revealed that higher CFC-F and CFC-I did moderate this well-established (in other literature) and observed (in the main effects of the present study) relationship, but only in females. Examination of these findings in the context of the susceptibility and buffering hypothesis of Joireman et al. (2008) suggests that in female adolescents, both of these models are at work. If indeed CFC-F is associated with a tendency to focus on ''pursuing (uncertain) gains'' and CFC-I with a tendency to focus on ''preventing (immediate) losses'' then both motivations appear to motivate females. The study findings must be interpreted in the context of some important limitations. Firstly, all data were obtained through self-report, although confidentiality and anonymity were guaranteed to

Table 2. Results of Spearman's ρ correlations (two-tailed) between variables measured. Note: results for females above the diagonal.

	CFC-I	CFC-F	A	H	VA	PA	AAIS
CFC-I	–	0.38**	−0.18**	−0.08	−0.12**	−0.25**	−0.26**
CFC-F	0.43**	–	−0.03	0.15**	0.07	−0.14**	−0.14**
A	−0.25**	−0.04	–	0.45**	0.53**	0.60**	0.34**
H	−0.26**	0.05	0.43**	–	0.43**	0.35**	0.14**
VA	−0.24**	−0.01	0.45**	0.40**	–	0.53**	0.25**
PA	−0.32**	−0.19**	0.61**	0.32**	0.44**	–	0.29**
AAIS	−0.20**	−0.12**	0.31**	0.07	0.22**	0.40**	–

CFC = Consideration of Future Consequences; A = Anger; H = Hostility; VA = Verbal Aggression; PA = Physical Aggression; AAIS = Adolescent Alcohol Involvement Scale.
**$p < 0.01$.

Table 3. The moderating effect of CFC subscales on the relationship between aggression and alcohol use among females.

	Consideration of future consequences (Future)					Consideration of future consequences (Immediate)				
	β	SE β	t	p Value	LLCF, ULCF	β	SE β	t	p Value	LLCI, ULCI
CFC Factor	−0.70	0.23	−3.06	0.002	−1.16, −0.25	−0.84	0.17	−4.94	0.000	−1.18, −0.51
Anger	1.13	0.13	8.69	0.000	0.29, 0.45	0.98	0.13	7.39	0.000	0.72, 1.24
CFC × Anger	−0.05	0.04	−1.50	0.135	−0.12, 0.02	−0.05	0.02	−1.97	0.049	−0.09, −0.01
CFC Factor	−0.91	0.23	−3.91	0.000	−1.37, −0.45	−1.01	0.17	−6.01	0.000	−1.33, −0.67
Hostility	0.65	0.15	4.28	0.000	0.35, 0.94	0.44	0.14	3.07	0.002	0.16, 0.72
CFC × Hostility	−0.10	0.04	−2.68	0.008	−0.17, −0.03	−0.08	0.02	−3.34	0.001	−0.13, −0.03
CFC Factor	−0.81	0.22	−3.62	0.000	−1.25, −0.37	−0.96	0.17	−5.84	0.000	−1.29, −0.64
Verbal Aggression	1.63	0.25	6.44	0.000	1.13, 2.13	1.32	0.25	5.31	0.000	0.83, 1.81
CFC × Verbal Aggression	−0.21	0.07	−2.99	0.003	−0.34, −0.07	−0.08	0.04	−1.91	0.051	−0.17, −0.01
CFC Factor	−0.57	0.23	−2.44	0.015	−1.03, −0.11	−0.83	0.17	−4.94	0.000	−1.17, −0.51
Physical Aggression	0.68	0.10	7.07	0.000	0.49, 0.86	0.56	0.10	5.49	0.000	0.34, 0.76
CFC × Physical Aggression	−0.07	0.03	−2.67	0.008	−0.13, −0.02	−0.04	0.18	−2.28	0.023	−0.07, −0.01

participants. Secondly, all participants were from schools in the Greater Belfast area of Northern Ireland, calling into question the generalizability of results. However, against these limitations are the facts that the study employed a large sample and used well established measures. Finally, participants in the present study were chosen by the contact teacher in each school. While teachers were asked to provide a sample representative of their school cohort, it is not possible to be certain that this was in fact done. However, while it may have been theoretically possible for teachers to have biased the results in terms of alcohol use, they would not have been able to have done so in respect of the other measures, as these ''psychosocial'' variables were not elaborated upon prior to data collection.

The results of the present study reveal that males scored significantly higher than females on measures of instrumental aggression, a finding broadly supported in the aggression literature (Abd-El-Fattah, 2013; Buss & Perry, 1992; Tremblay & Ewart, 2005). Moreover, the lack of a significant difference on AAIS score between males and females reflects recent evidence suggesting that a convergence has taken place such that girls are as likely as boys to drink problematically (Eisenbach-Stangl & Thom, 2009; Health Promotion Agency, 2005; Northern Ireland Statistics and Research Agency, 2008). Finally the significant ''main effects'' relationships between higher aggression, lower CFC and higher AAIS score are all in line with the literature discussed in the introduction. However, the fact that moderation was only observed for females and not males is both difficult to explain, and potentially a less useful finding in terms of the potential for prevention of alcohol problems among adolescents.

Gender differences in time perspective more broadly have been inconsistent. For example, in attitudes toward the future (Lamm, Schmidt, & Trommsdorff,1976), and in terms of optimism scores (Scheier & Carver, 1985; Snyder et al., 2002), research has revealed no significant gender differences.

Worrell (2006) reported significant but modest differences in academic perceived life chances between male and female adolescents, while Mello (2008) reported that females and males showed similar educational expectations, but that males were less likely to expect that they would attain a professional occupation than females. One possible explanation for the results of the present study lies in the assessment of future orientation using the CFC. Although widely used, the unidimensional nature of the scale has been criticized, namely the fact that it assesses future orientation but not past and present concurrently (Zimbardo & Boyd, 1999). Yet, another important direction of additional research is to examine the *domain* of future, where gender differences have been observed in education, work, and family (Seginer, 2008).

For adults and adolescents, risky behaviour has been shown to be associated with anticipated positive consequences (Galvan, Hare, Voss, Glover, & Casey, 2007). One study of costs/benefit analyses in adolescents showed that, in general, the costs which adolescents anticipate are more important than the anticipated benefits in determining risky health-compromising behaviours (Small, Silverberg, & Kerns, 1993). Adolescents who do not engage in risky behaviours have been shown to anticipate significantly more costs to the behaviours relative to their risk-taking peers (Small et al., 1993; Galvan et al., 2007). As described in the ''Introduction'' section, cognitive representation of future events in the present allows them to be converted into current motivators and regulators of behaviour, thus behaviour is motivated and directed by projected goals and anticipated outcomes rather than an unrealized future state. As a behavioural assessment of future orientation, one explanation for the moderation results in the present study might be that females, more than males, are better able to translate the cognitive awareness or understanding of the future into behaviour and/or behavioural intentions.

Specifically in terms of the moderating effect of CFC on drinking behaviour for females, recent evidence suggests that differences in cognitive functioning and development between adolescent males and females are minimal (Hyde, 2014). However, within the broader time perspective literature a number of issues might be relevant. Firstly, Steinberg and colleagues (2009) reported small but significant gender differences in terms of planning ahead, anticipation of future consequences and time perspective, with females outscoring males in each case. Moreover, Harber, Zimbardo, and Boyd (2003) found that individual differences in time perspective influenced how promptly and reliably students completed research obligations with more future oriented students enlisting in studies sooner than their peers. There was an observed gender effect with female ''futures'' starting their required experiments on average two weeks sooner, completing the middle portion of their experiments two-and-a-half weeks sooner, and completing their entire experiment quotas one-and-a-half weeks sooner, than did male ''presents''.

Keough, Zimbardo, and Boyd (1999) compared male and female adolescents and young adults across multiple samples and a diverse set of contexts on the Future and Present subscales. Keough et al. reported significantly higher scores for females on the Future subscale and significantly higher scores for males on the Present subscale. In another study, Zimbardo and Boyd (1999) reported that females had significantly higher scores on Future than males. However, no gender differences were found for Present scores. In a third study, Mello and Worrell (2006) examined gender differences in a sample of adolescents. Although males and females differed significantly on Future Negative attitudes, the difference accounted for less than 2% variance. Finally, Boniwell, Osin, Linley, and Ivanchenko (2010) reported no gender differences in group membership across time attitude profiles in British and Russian undergraduates. In sum, most of the extant research indicates that there are few gender differences in time attitudes, and the differences that have been found are inconsistent or have small effect sizes. In a multi-sample study, Keough et al. (1999) argued that variation in ''future'' and ''present'' time perspective scores were more related to substance use than gender. Rothspan and Read (1996) reported that for males only, Future Orientation scores were positively associated with healthy sexual behaviours, whereas the relationships were not observed for females.

Inconsistent gender differences have also been also observed in the relationship between aggression and substance use. White, Brick, and Hansel (1993) demonstrated that the patterns of relationships between aggression and

alcohol use were the opposite between genders. Specifically, among females, alcohol use predicted later aggression, whereas, for males, aggression predicted later alcohol use. In contrast, Bachman and Peralta (2002) indicated that alcohol and substance use were positively associated with violence for both females and males. Skara et al. (2008) showed how physical aggression predicted alcohol use for males but not for females, whereas relational aggression predicted cigarette and marijuana use for females but not for males.

In conclusion, we hypothesised that the relationship between alcohol use and aggression could be moderated by CFC. The results support this hypothesis, both for the consideration of immediate and future consequences, but for females only. This has important implications for interventions targeting young drinkers. In particular, messages designed to encourage adolescents to be considerate of the immediate (e.g. fighting, falling, being sick) and future (e.g. chronic illness) may be useful when delivered to young females, but not young males. Future research might attempt to tease out the precise mechanism by which this is the case, and in the interim explore additional contexts within which to frame health promotion messages for young male drinkers.

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Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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