Adolescents consider the future differently depending on the domain in question: Results of an exploratory study in the United Kingdom.

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Abstract

The study of Consideration of Future Consequences (CFC) construct has increased substantively in recent years. Underlying these developments is the presumption that consideration of the future is uniform across all domains, and not a domain-specific construct. Building on work undertaken previously, the present study used 30 researcher-derived items to assess the domain specificity of consideration of the future in three large samples of adolescents in the United Kingdom. A psychometrically valid and reliable 18-item scale measuring consideration of the future in four domains emerged. Domain specificity was supported on two levels: a good fitting multidimensional model of CFC; and low to moderate factor correlations for the four domains measured by the 18-item scale. The study suggests that adolescents are considerate of future outcomes to different degrees, depending on the domain, and the implications of this with regard to future research are discussed.

Keywords: Consideration of the Future; Domain specific

1. Introduction

In their seminal paper in which they developed the 12-item Consideration of Future Consequences Scale (CFCS-12), Strathman et al (1994) presented CFC as an individual difference variable assessing the degree to which individuals consider the potential future outcomes of their behavior, and the degree to which that consideration impacts on present behavior (Strathman, Gleicher, Boninger & Edwards, 1994). Moreover, they discussed a continuum at whose extremes were individuals who either fully considered the future consequences of their behaviors, or were not at all interested in these consequences. Accordingly, as an individual difference variable, it might be presumed that someone who is high in CFC would consider future consequences in all aspects of their lives, while an individual low in CFC would ignore all future consequences.

Indeed, a large and growing body of literature has demonstrated a significant and meaningful relationship between scores on the CFCS-12 and a range of outcomes within domains as diverse as financial planning, health-related behaviour, and environmental concern (for a review see Joireman & King, 2016). Within the domain of finances, higher CFC has been found to be associated with lower levels of compulsive buying tendencies (Joireman, Kees, & Sprott, 2010). In the area of health, studies have shown that those higher in CFC are more likely to eat healthily (Dassen, Houben, & Jansen, 2015) and take regular exercise (Mullan, Allom, Brogan, Kothe, & Todd, 2014). Additionally, research has demonstrated a meaningful relationship between higher CFC and environmental concern, with those higher in CFC being more likely to campaign for pro-environmental action (Carmi & Arnon, 2014). However, one weakness in the extant literature is that studies have focussed on one domain of interest, therefore, the degree to which individuals think about the future across domains remains poorly understood. For example, Dassen et al (2015) recently asserted that “for the purposes of behavior prediction, CFC should be tailored to the behavior at interest and not be measured as a general construct" (p.17).

Despite the large and growing CFC literature, issues remain with regard to the measurement and operationalization of the construct and these have already been detailed elsewhere, in particular, how concerns about psychometric validity and internal consistency precipitated the development of the CFCS-14 from the CFCS-12 (see Joireman & King, 2016). In a specific examination of the CFCS-12, Authors blinded (2012) reported that adolescents found the wording of that scale complicated and the non-specific nature of items problematic. That is, they reported finding an abstract notion of 'the future', unrelated to specific future events or specific future domains (for example 'the environment'), problematic. Participants in that study, and in a follow-up study (Authors, blinded, 2016) reported that they (and their peers) are generally inconsiderate of the future consequences of alcohol-use behaviors. It remains unclear how universally or selectively considerate adolescents are of a range of other future consequences, including those beyond the area of health.

Adolescence is a transition period from childhood to adulthood and therefore involves making decisions that will have long-term life consequences (e.g. Finlay, Wray-Lake, Warren, & Maggs, 2014). Research has pointed to the importance of adolescence as a critical period for the development of present and future identity (e.g., Simons, Vansteenkiste, Lens, & Lacante, 2004), and during adolescence individuals begin to attribute a greater importance to the future (Sroufe, Egeland, Carlson, & Collins, 2005). A large body of research has documented substantive changes across the lifespan in individual time preferences with children and adolescents being generally more present focused than adults (e.g., Siu, Lam, Le, & Przepiorka, 2014). However, with increasing age the ability to delay gratification increases (e.g., Kageyama, 2013), as does the value placed on delayed rewards (e.g., Green, Fry & Myerson, 1994), and general self-control (e.g., Shavit, Lahav & Benzion, 2013).

Given the literature reviewed above, the present study aimed to examine the degree to which adolescents consider the future equally across a range of domains, principally those found previously to be related to the CFCS-12 construct.

Study 1

2. Methods

2.1 Participants

Participants were 436 school children (346, 79.5% female) recruited from six schools in the greater Belfast area of Northern Ireland. Participants were 15 years old (school Grade 11) at the time of data collection.

2.2 Measures

Participants were supplied with 30 researcher-derived items (see Appendix 1) assessing consideration of the future in six domains: School/Education; Dental Attendance; Financial Planning; Environmental Concern; Eating Behaviours; and Physical Exercise. These domains were purposively chosen as a growing body of previous research has reported meaningful relationships between these and CFC (see Joireman & King, 2016). Given the issues previously raised regarding the assessment and understanding of CFC (Authors, blinded, 2012; 2016) these new items were written for the adolescent audience and screened for readability. We also took cognisance of the wording of items in a range of other scales including those assessing future time perspective (Husman & Shell, 2008); future orientation (Seginer, Nurmi, Poole & Shoyer, 2009); and values, task perceptions, and success expectancies (Eccles & Wigfield, 1995). However, we were keen not to replicate these verbatim, and on the basis of the focus group discussions previously described, were keen for the items to be as immediate as possible.

The final 30 items were firstly piloted with schoolchildren in four High Schools in order to ensure that they were comprehensible and relevant. Responses to the 30 items were given on a five-point scale ranging from 1 = '*Totally disagree*' to 5= '*Totally agree*', with some items being reverse scored. It is worth pointing out that some of the items agreed upon are similar in wording to some items elsewhere (for example, the Food Choice Questionnaire: (Steptoe, Pollard & Wardle, 1995), and the Environmental Perception Scale (Bogner & Wiseman, 1999).

2.3 Data Analysis

Factorial validity was initially explored using exploratory structural equation modelling (ESEM; Asparouhov & Muthén, 2009) in Mplus 7 (Muthén & Muthén, 2012). ESEM enables the estimation of all loadings from each observed variable onto an identified number of latent variables. As this study aimed to explore the validity of an a priori model while seeking to develop a new measure, ESEM provided an effective mixture of exploratory and confirmatory approaches. To guard against departure from multivariate normality, the robust maximum likelihood estimator (MLR) was used. Given the anticipated relationships between factors, the oblique, geomin rotation was employed throughout. In terms of model fit, Hu and Bentler's (1999) recommendations of the comparative fit index (CFI) and Tucker-Lewis index (TLI) of close to .95 for incremental indices, and the standardised root-mean-square residual (SRMR) close to .08 and root-mean square error of approximation (RMSEA) of close to .05 were considered for absolute fit indices. Regarding parameter estimates, intended factor loadings were interpreted using Comrey and Lee's (1992) recommendation of .32 (poor), .45 (fair), .55 (good), .63 (very good), and .71 (excellent). Cross-loadings of > .30 were considered as mis-specifications, as were cross-loadings greater than intended loadings.

The measurement model was subjected to an iterative process to remove items identified as conceptually weak or detrimental to model fit in order to achieve a satisfactory fit. This method is preferred to the sometimes-used method of correlating error terms, which has been demonstrated as often sample-specific (Perry, Nicholls, Clough, & Crust, 2015). Upon achieving a satisfactory model fit through ESEM, the model was examined using confirmatory factor analysis as an independent cluster model (CFA-ICM). Specifically, this model constrained all cross-loadings to zero, while allowing factors to correlate (Marsh, Morin, Parker, & Kaur, 2014). We also tested the new items as a single-factor model. To further investigate this, the factor correlations from the best fitting multidimensional model were explored. The extent to which factors are related provides an insight into how similar or distinct they are. Therefore, small correlations indicate conceptual difference. To interpret the strength of the factor correlations, Zhu's (2012) recommendations of <.20 (no correlation), .20-.39 (low correlation), .40-.59 (moderate correlation), .60-.79 (moderately high correlation), and ≥ .80 (high correlation) were used.

3. Results

Preliminary analyses screened for outliers for all 30 original items using Q-Q plots, which identified no issues. Less than 1% of data was missing and there were no issues with univariate skewness (< 2) or kurtosis (< 2) following visual inspection. To explore the factorial validity of the scale, we conducted ESEM using a six-factor model. This produced a reasonable fit (Table 1, row 1), though the exercise and eating behavior factors combined to form one factor and the sixth factor was largely a collection of cross-loadings from negatively phrased items with little conceptual meaning (supplementary material, Table 1). Consequently, this factor was dropped to form a five-factor model. The five-factor model (Table 1, row 2) also yielded a factor that combined cross-loadings of items that were not conceptually related. Further, a set of items related to dental attendance loaded on the same factor as school but were substantially weaker (4 item loadings < .40). These four items were removed and the next model tested was a 26-item, 4-factor model (Table 1, row 3). All factors presented a significant loading onto their intended factor and made conceptual sense with no cross loadings greater than .40. To refine the model, we next considered weak loading items.

Four items presented a loading of < .40 and were therefore removed. This yielded a 4-factor, 22-item model in which all loadings on their intended factor were substantive (> .40) but model fit was not sufficiently good (Table 1, row 4). Modification indices identified four items that were highly correlated with other items, therefore providing minor misspecifications. After removing these items, model fit was improved (Table 1, row 5) to produce a well-fitting 4-factor, 18-item model (for factor loadings, see supplementary material, Table 2).

Descriptive statistics for this model are presented in Table 2. Internal consistency was assessed using omega point estimates and bootstrapped confidence intervals in addition to Cronbach's alpha, as this method has less assumptions than alpha (Dunn, Baguley, & Brunsden, 2013). Omega point estimates and confidence intervals were calculated using the MBESS package (Kelley & Lai, 2012) in R (R Development Core Team, 2012) with 1,000 bootstrap samples. All subscales comfortably exceeded the generally acceptable level of >.70.

Factor loadings for this model are presented in Table 3. All items loaded significantly on their intended factor with no substantive cross-loadings. As the factors appeared relatively independent, we also examined the four factors as an independent cluster model using confirmatory factor analysis (ICM-CFA). In this model, all cross-loadings are constrained to zero. Despite the extra constraints, model fit did not deteriorate substantially (Table 1, row 6).

To test the extent to which the scale is multidimensional, we tested a single-factor model, whereby the 18 items were all loaded onto the same factor. This stage is to objectively discount the potential unidimensionality of the model. Model fit was weak (Table 1, row 7), which supports the multidimensional structure. Further support for the multidimensionality of the scale is obtained in the factor correlations from the 4-factor ESEM (Table 3). Factor correlations ranged from .18 (no correlation) to .49 (moderate correlation), which indicates that factors are conceptually different from each other.

Study 2

The purpose of Study 2 was to further test the model developed in Study 1.

4.1 Participants

Participants were 2,199 school children (933, 42.4% female [gender missing for n = 68, 3.1%]) from 22 schools recruited to take part in a longitudinal research study in Scotland and Northern Ireland. Participants were all 14-15 years old (school Grade 11) at the time of data collection.

4.2 Measures

Participants completed the 18-item domain-specific CFC scale developed in Study 1.

4.3 Data Analysis

To determine if the factorial validity presented in Study 1 could be replicated on an independent sample without model modification, we conducted ESEM and CFA to assess factorial validity using the same procedures as identified in Study 1. To explore the potential for a multidimensional, aggregated measure, whereby individual subscale scores and overall consideration of the future is determined, a bifactor model with a general factor indicated by all items was tested using both ESEM and CFA techniques. We examined geographical invariance principally because in recent studies (Authors, blinded), while we found geographical invariance on scale scores for the ATI-TI, slightly different temporal profiles emerged when model-based clustering was used to create temporal profiles based on those scores.

5.3 Results

Preliminary analyses found no issues with missing data (< 1%), outliers, univariate skewness (< 2), or kurtosis (< 2). Descriptive statistics are presented in Table 4. The 18-item, four-factor model from Study 1 was initially tested using ESEM. This achieved a good model fit (Table 5, row 1), which was almost identical to that presented in Study 1. Inspection of the standardized parameter estimates revealed a complete absence of substantive cross-loadings. Fourteen of the 18 items presented a factor loading greater than .55 (good). Of these, 12 were very good (≥ .63), and nine were excellent (≥ .71) (supplementary material, Table 3). Like

ESEM, CFA presented a good model fit (Table 5, row 2), also similar to that presented in Study 1.

The single-factor model presented weak model fit (Table 5, row 3), supporting the multidimensionality of the scale. Factor correlations (Table 6) for both models were consistent with the findings in Study 1 and ranged from .32 (low correlation) to .48 (moderate correlation), supporting the conceptually different nature of the factors. Although the factors appear distinct from each other, the low to moderate correlations between them are all positive and indicate the potential for a bifactor model in which an additional general factor is included in both ESEM and CFA models to measure overall consideration of the future. In this model, correlations were constrained to zero and factor variance was constrained to one to set the metric. ESEM bifactor model fit was excellent (Table 5, row 4) but CFA bifactor model fit deteriorated (Table 5, row 5). The standardized loading pattern however, demonstrated similar findings in both models. Specifically, subscale factor loadings were larger than general factor loadings with the exception of the health and wellbeing factor, in which only one item loaded greater on the subscale than the general factor. Overall, the multidimensionality of the scale is supported but the use of an overall CFC score is questionable.

To test measurement invariance, we performed two multigroup CFAs to examine gender and location invariance. For each, configural invariance was assessed first by replicating the model across sample groups. Second, we examined metric variance by constraining factors. Third, scalar invariance was examined by constraining factors and intercepts and finally, residual invariance was tested by constraining factors, item intercepts, and factor means. Measurement invariance was deemed to have been supported if little or no change was evident on the increasingly constrained models. As a guide, Cheung and Rensvold (2002) suggested $\Delta CFI \leq .01$. The results supported invariance for location but not for gender (Table 7). A small amount of scalar variance is evident for gender, indicating variance in some item means for item means. We explored this further by testing for partial invariance by sequentially freeing each item mean while maintaining metric invariance. Fourteen items demonstrated ΔCFI $\leq$ .002, three reduced CFI by .003 and item one reduced CFI by .005. Overall, 4/6 health and wellbeing items maintained scalar invariance for gender, 3/4 did so for environmental concern and for school/education, and all items were invariant for financial concern. Partial invariance was supported. To ensure that the scale is appropriate for use in both genders, we tested the CFA-ICM model separately in males and females. Model fit for males was lower than the overall fit but still acceptable: $\chi2(129) = 577.55$, $p < .001$, CFI = .924, TLI = .909, SRMR = .052, RMSEA = .054 (90% CI = .050, .059). All loadings were substantive. The female model presented a good fit: $\chi2(129) = 330.20$, $p < .001$, CFI = .958, TLI = .951, SRMR = .037, RMSEA = .041 (90% CI = .036, .047). The baseline model fits provide some assurance of the suitability of the measurement scale in both genders despite the evidence of some variance.

6. Discussion

The present study used researcher-derived and adolescent-endorsed items to examine whether adolescents are equally considerate of the future across a range of domains, and also to examine if this could be assessed in a psychometrically valid and reliable way. Rather than just adopting a data-driven approach to achieving acceptable cut-offs (in fact the fit indices for the 30-item version were ‘acceptable’), the final 18-item scale was arrived at by a mixture of measurement and theoretical considerations. For example, although the ‘dental attendance’ items loaded weakly onto the school factor, this is clearly problematic from a theoretical point of view.

The resultant 18-item scale presents good evidence for initial psychometric validity and reliability with all omega estimates in both studies exceeding the 0.7 threshold. Results clearly demonstrate the domain specificity of future thinking in these large samples. It is important to stress that the primary focus of this study was to test the domain specificity of this future thinking. We are aware that the temporal psychology literature is already fractured, with multiple versions of scales in use (Worrell et al., in press). It was never the intention of the study to question the utility of the CFCS-12 and/or CFCS-14, indeed we have had research published using both scales (e.g. Authors, blinded). Rather, we were keen that our individual items actually measured future thinking in distinct domains, and we were keen to avoid repeating the CFCS-12 or CFCS-14 items six times (for our original six domains) with suffixes added to represent the domain. Our concerns in avoiding this methodology revolved around the potential effects of priming (discussed further below) and research fatigue, the requirement to administer 84 repetitious items.

Evidence for domain specificity was two-fold. Firstly, in both studies, the single-factor model of CFC did not provide a good fit for the data. Secondly, the factor correlations between the four factors that finally emerged were small to moderate, indicating that they measured related, but also discrete constructs. In light of this it is reasonable to wonder what precisely is influencing scoring on generic measures of CFC or future orientation. Further studies could examine this by using both overall and domain-specific measures. It is possible that different respondents may interpret items on the CFCS-12 or CFCS-14 in a domain specific way and the same respondents may be primed to do so on different occasions. In both cases the respondents would thus be answering different questions. For example, completion of the CFCS-12 or CFCS-14 could be influenced by macro-level issues (for example, a focus on climate change in the National news, or the recent vote in the United Kingdom to leave the European Union), or by individual-level issues, (for example, impending statutory examinations). Accordingly, Greitemeyer (2013) examined the extent to which climate change affirming and climate change sceptic films were successful in affecting people's environmental concern. One of the secondary outcomes reported was the fact that watching a climate change sceptic film decreased participants' CFC, which in turn decreased their environmental concern. Priming is therefore an important next step for investigating future thinking in adolescents.

A by-product of our investigation is the development of an age-appropriate and domain specific assessment tool for use in adolescents and/or those of school age. Given the issues outlined in the introduction with regard to the development of CFC across the lifespan, and the associated neurological development, this is a potentially important contribution to the temporal psychology literature. However, the results of the present study are interesting also in light of the on-going difficulties with psychometric validity of the CFC construct (Joireman & King, 2016). When researchers report problems with validity and reliability in their attempts to assess CFC as a stable trait this may have something to do with the specific way that different individuals will consider the items and their responses. For example, when asked to consider a question about the future, two individuals may respond entirely differently depending on the context that they give to the item in their own minds. Indeed, the same person may respond differently to the same item, depending on the context that they themselves give to it.

The present study is not without limitations. Firstly, all data were self-reported. Secondly, the inclusion of school-specific items limits the general use of the emerging scale to adolescents or schoolchildren. Although evidence of the psychometric properties of the 18-item model was generally very strong, there did appear to be some scalar variance for gender. This likely means that the general level of concern for some of the future consequences are greater in one gender. Future research should examine demographic impacts on CFC to determine if this is a general trend or a sample-specific observation. Despite the limitations of this study the current results suggest that the CFC construct is domain specific for adolescents.

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