The structure of impulsivity among prisoners

Impulsivity among adult prisoners: A confirmatory factor analysis study of the Barratt Impulsivity Scale.

Abstract

The current study explored the structure of a commonly applied impulsivity measure, the Barratt Impulsivity Scale [BIS-11], in a sample likely to include elevated levels of impulsivity (i.e. a prison sample). The main aim was to assess whether the original factor structure of the BIS could be confirmed in a large sample (n = 1,103), comprising two subsamples of adult men (n = 383 and 250), and adult women (n = 250 and 220) prisoners. It was predicted that the three factor solution originally proposed (i.e. motor; attentional; non-planning) would be replicated; and produce a multidimensional structure consistent across sex. Although exploratory analysis indicated a three factor solution, the nature of the factors was different to those originally proposed for the BIS-11 although there was some convergence for ‘behavioural [motor] impulsivity’. A different factor structure was preferred for women. The importance of assessing in detail the structure of commonly applied research measures using confirmatory approaches is outlined, with implications for research noted.

KEY WORDS: Impulsivity; Prisoners; BIS; impulsivity factor structure; Sex differences
Introduction

Impulsivity plays a prominent role in understanding and diagnosing various forms of psychopathology and, after subjective distress, represents the most common diagnostic criteria in the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV). Despite its’ pervasive importance as a concept across psychology, there remains a lack of clarity both on its definition and its component structure (Whiteside & Lynam, 2001), with researchers questioning the consequent utility of existing methods of measurement (e.g. Carrillo-de-la-Peña, Otero & Romero, 1993). With regards to definition, some link impulsivity with concepts such as ‘sensation-seeking’ and use the terms synonymously (e.g. Dom et al, 2006); others describe it as a closely related personality trait (Lejoyeux et al, 1998); others consider it a concept closely related to ‘executive functioning’, with a basis in neuropsychological functioning (Cohen, Rosenbaum, Kane, Warnken & Benjamin, 1999); whereas others argue it is synonymous with ‘self-control’ (e.g. Baumeister & Vohs, 2007).

Despite difficulties in definition, there has been a considerable amount of research exploring how impulsivity relates to a range of externalising problems. These include substance misuse (e.g. Dom, De Wilde, Hulstijn, van den Brink & Sabbe, 2006), personality disorders (e.g. Fossati et al, 2007), dyslexia (e.g. Baker & Ireland, 2007) aggression (e.g. Smith, Waterman & Ward, 2006; Fossati et al, 2007), self-injurious behaviour (e.g. Raust et al, 2007), compulsive buying (e.g. Billieux, Rochat, Ribetez & Van der Linden, 2008), major mental illness (e.g. Enticott, Ogloff, Bradshaw & Fitzgerald, in press), and anger and psychopathy (e.g. Jackson, Neumann & Vitacco,
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2007). It is clear that impulsivity is considered relevant to a range of social and individual problems.

There are a number of impulsivity measures available ranging from psychometric instruments to neuropsychological/cognitive testing, although they do not necessarily all correlate with one another (Campbell, 2006). The Barratt Impulsivity Scale (BIS) is the most commonly applied psychometric measure of impulsivity (Spinella, 2007). It has been used across a range of contexts and countries, and translated into various languages (e.g. Baylé et al, 2000; Fossati, Di Ceglie, Acquarini & Barratt, 2001; von Diemen, Szobot, Kessler, Pechansky, 2007).

The BIS has also been subject to a number of revisions. The original 1959 (Barratt, 1959) version portrayed impulsivity as uni-dimensional, but subsequent revisions moved to a multi-dimensional construct. A final revised version was produced in 1995 (version 11) comprising three factors: motor (behaviour), attentional (cognitive) and non-planning. Evidence for these factors was found in samples of undergraduates, psychiatric inpatients and adult male prisoners (Patton, Stanford & Barratt, 1995). However, the sample size for inpatients and prisoners in this study was small for a factor analysis, with no use of formal confirmatory factor analysis (CFA).

Although some studies, including those using a shorter version of the BIS (e.g. Spinella, 2007), have retained the three-factor structure, research has far from confirmed it (Whiteside & Lynam, 2001). Studies employing exploratory factor analysis have produced similar but not identical factors (Baylé et al, 2000), although studies specifying factors a priori in exploratory analyses have reported more convergence (Spinella, 2007). However, this is still not as rigorous an assessment as confirmatory factor analysis.
There have, however, been differences noted across studies; for example, a smaller number of factors have been reported with and Italian adolescents (Fossati et al., 2001); and a translated version for Portuguese adolescents failed to produce a three-factor structure (von Diemen et al., 2007). Thus, although there appears agreement that the BIS can be used as a unidimensional [single factor] measure, the originally proposed three-factor structure, remains unconfirmed across a range of samples.

There have been few large scale studies exploring the multi-dimensional nature of impulsivity in populations where impulsivity is expected to be elevated. The majority of research has focused on student samples where, arguably, impulsivity is not a problem of clinical levels. Impulsivity is associated with a range of externalising problems, such as personality difficulties, attention-hyperactivity disorder, aggression and substance use (Whiteside & Lynam, 2001). Accessing populations with increased evidence of such problems, and therefore an expectation of higher risk for elevated impulsivity, is of value in determining the nature and structure of impulsivity. Indeed, the failure to explore the factor structure of impulsivity and other psychometric properties beyond undergraduate student populations has been a noted criticism by those attempting to define and conceptualise impulsivity (Whiteside & Lynam, 2001).

The current study aims to explore the nature and structure of impulsivity in a sample where elevated levels of impulsivity are expected, in this instance a prisoner sample. It will employ both parallel and confirmatory factor analysis, across four adult samples of men and women prisoners. It was predicted that: (1) The three factor solution proposed by Patton et al. (1995) would be replicated; 2.) That the multi-dimensional structure of the BIS would be consistent between sex.
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Method

Four samples were employed as follows:

*Study I participants:* Adult men (n = 442) were sampled from two medium secure prisons in the UK. Fifty-nine failed to complete the questionnaire, leaving a final sample of 383 (86.7% completion rate). The mean age was 32.9 years (SD = 11.1). Eighty-nine percent were of White ethnic origin. Thirty-one per cent were serving for violent offences, 22 per cent for acquisitive offences, 22 per cent for sex offences, 17 per cent for other indictable offences and eight per cent for drug offences.

*Study II participants:* Adult women (n = 287) were sampled from two medium secure prisons. Thirty-seven failed to complete the questionnaire, leaving a final sample of 250 (87% completion rate). The mean age was 32.0 years (SD = 8.8). Ninety-two per cent were of White ethnic origin. Thirty-five per cent were serving for violent offences, 30 per cent for drug offences, 25 per cent for acquisitive offences and 10 per cent for other indictable offences.

*Study III participants:* Adult men (n = 295) were sampled from four medium secure prisons. Forty-five were excluded for failing to complete the questionnaire, leaving 250 (84.7% completion rate). The mean age was 32.5 years (SD = 9.8). Ninety per cent were of White ethnic origin. Thirty-seven per cent were serving for violent offences, 25 per cent for acquisitive offences, ten per cent for sex offences, 11 per cent for other indictable offences and 17 per cent for drug offences.

*Study IV participants:* Adult women (n = 236) were sampled from two medium secure prisons. Sixteen failed to complete the measures, leaving a final sample of 220 (93.2% completion rate). The mean age was 30.7 years (SD = 8.6). Eighty-nine per cent
were of White ethnic origin. Twenty-seven per cent were serving for violent offences, 36 per cent for acquisitive offences, one per cent for sex offences, 8 per cent for other indictable offences and 28 per cent for drug offences.

Measures

All prisoners completed the Barratt Impulsivity Scale, Version 11 (BIS-11; Patton et al, 1995). Two items were removed for the purposes of the current study since they were not applicable to a prison sample (i.e. ‘I change where I live’ and ‘I plan for job insecurity’). The BIS-11 comprised 28 statements. Participants were asked to respond on a 4-point Likert scale (1 = rarely/never to 4 = almost always/always).

Procedure

All questionnaires were administered during a lunchtime period when prisoners are in their cells on their own. They were given to each prisoner personally by a research assistant. All were informed of the nature, purpose and anonymity of the study. Analysis was conducted using SPSS and AMOS for the Confirmatory Factor Analyses.

Results

Initially, the structure of the BIS is examined with regards to its unidimensional structure, followed by an attempt to confirm the published three factor structure. Following this are exploratory and confirmatory stages examining a proposed revised factor structure. All models were recursive and identified and standardized with variances set to 1.00. Samples from studies I and II were used to explore the factor structure, with samples from studies III and IV used to confirm the revised structure.

STEP I: Is the BIS-11 unidimensional?
Two confirmatory factor analyses were conducted, one on adult men (Study I) and one on adult women (Study II), with a single latent variable. The models failed to fit for the men ($\chi^2 (350) = 1668.99 [P = .00]; \text{RMSEA} = .10 [.09 to .10]; \text{GFI} = .63; \text{CFI} = .51; \text{ECVI} = 4.66 [4.33 to 5.00]$) and the women ($\chi^2 (250) = 1287.33 [P = .00]; \text{RMSEA} = .10 [.09 to .11]; \text{GFI} = .61; \text{CFI} = .50; \text{ECVI} = 5.62 [5.19 to 6.08]$).

**STEP II: Confirming the published three-factor structure of Patton et al (1995)**

Following demonstration of a non unidimensional structure, the next step was to attempt to confirm the BIS-11 structure proposed by Patton et al (1995), using samples from studies I and II. The three factors were Non-Planning (10 items); Motor (10 items); and Attentional (8 items). This was explored separately between men and women using confirmatory factor analysis. Covariances were added between the factors to reflect their correlation. The models produced are presented in Figures I - II.

The three factor model failed to fit the observed data well for men ($\chi^2 (347) = 1342.7 [P = .00]; \text{RMSEA} = .09 [.08 to .09]; \text{GFI} = .77; \text{CFI} = .63; \text{ECVI} = 3.82 [3.53 to 4.13]$); i.e. although the RMSEA value was below .10, neither GFI nor CFI exceeded .90.

The three-factor model also failed to fit the observed data well for women ($\chi^2 (357) = 1065.3 [P = .00]; \text{RMSEA} = .09 [.08 to .09]; \text{GFI} = .75; \text{CFI} = .62; \text{ECVI} = 4.75 [4.37 to 5.16]$). For both models an attempt was made to improve fit by examining modification indexes and covariances. Adding item covariances still ensured the models failed to fit the observed data.

**STEP III: Exploring the factor structure of the BIS-11**

The next step focused on exploring the structure of the BIS-11. The data was found suitable for exploratory factor analysis for both men and women (using studies I
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and II), i.e. inspection of the correlation matrix revealed the presence of many coefficients .4 and above, a Kaiser-Meyer-Olkin value of .87 for men and .83 for women, and a Bartlett’s test of Sphericity of statistical significance. Two factor analyses were conducted in the first instance, separately for men and women. In order to more strictly identify the number of factors evident, Parallel Analysis (PA), was employed. An examination of the initial factor outlines and explained variance suggested similarities between sex and thus men and women from studies I and II were combined. Parallel Analysis indicated a three-factor solution. A Principal Components Analysis with Varimax Rotation was thus employed (to make the use of future item parceling more appropriate and to ensure no assumptions about the model were made). Results are indicated in Table I, along with the original positioning in the BIS-11 factors and reliability analyses. Two items (22 and 3), ‘I solve problems by trial and error’ and ‘I am happy-go-lucky’ failed to load. Factor 1 was best described as Cognitive Planning Skills; Factor 2 as Behavioural Impulsivity; and Factor 3 as Distractability.

STEP IV: Confirming the revised structure

The next step focused on confirming the revised three-factor structure on two different samples (250 men: Study III and 220 women: Study IV). Reliability analyses for each factor were conducted, separately for men and women. These produced alphas ranging from moderate to good, accounting for the number of items (see Table 1), with all item-to-total correlations positive (Men: Factor 1, $\alpha = .85$; Factor 2, $\alpha = .79$; Factor 3, $\alpha = .67$; Women: Factor 1, $\alpha = .85$; Factor 2, $\alpha = .78$; Factor 3, $\alpha = .61$).

Item parcels were employed to examine the model structure in order to reduce error rates (Anderson et al, 2006). They were calculated by using factor totals and
correlation magnitude (Table I indicates the parcel into which each item was placed)². Two confirmatory factor analyses were conducted, one for men and one for women. Covariances were added between factors to reflect their correlation.

For men this produced a model of good fit ($\chi^2 (24) = 37.2 \ [P = .04]$; RMSEA = .047 [.009 to .08]; GFI = .97; CFI = .98; ECVI = .32 [.27 to .90]), and an improvement over a model not including covariances (RMSEA = .15 [.13 to .17]; GFI = .88; CFI = .81; ECVI = .83 [.68 to 1.02]). This model is presented in Figure III³. The three-factor solution did not fit the data for women, with fit indices poor ($\chi^2 (24) = 108.4 \ [P = .00]$; RMSEA = .12 [.10 to .15]; GFI = .92; CFI = .88; ECVI = .69 [.56 to .85]). Removing covariances worsened the model fit. Attempts to improve the model fit for women were made by examining modification indexes and item covariances. The factor Distractibility appeared to fit poorly overall. Removal of this factor brought model fit to an acceptable level, most notably with regards to GFI and CFI, with RMSEA brought below .10 (RMSEA = .09 [.05 to .14]; GFI = .96; CFI = .96; ECVI = .23 [.18 to .32]). The model is presented in Figure IV³.

Discussion

The current study did not support the original three factor BIS-11 structure proposed by Patton et al (1995). The prediction was thus not supported. The current findings are consistent with previous research that has also failed to replicate the factors (e.g. Fossati et al, 2001; von Diemen et al, 2007). It seems, therefore, that there remains difficulty in confirming the true structure of the concept of impulsivity (Whiteside & Lynam, 2001); with the current study demonstrating that this extends to samples where elevated levels of impulsivity are expected. The failure to confirm the original three factor solution is not
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surprising when it is considered that a confirmatory analysis was never undertaken with
the original BIS-11 study. Parallel analysis in the current study (Study I and II)
demonstrated, however, that a three factor solution was an optimal fit. The revised
factors in the current study described cognitive planning skills, behavioural impulsivity
and distractibility. All factors were easily interpretable and although the *themes* were
similar to those proposed by Patton et al (1995), the placement of items were markedly
different. The cognitive planning skills factor, for example, appeared to comprise
attention and non planning items from the original factor structure of Patton et al (1995),
suggesting that a failure to plan incorporates attentional ability. Only the factor
‘behavioural impulsivity’ demonstrated any clear convergence with the original BIS-11
solution with this comprised largely of motor items.

The ensuing confirmatory analysis showed two interesting features: (1) the data
fitted the proposed three factor model for men only when covariance between factors was
allowed; and (2) for women, a two-factor solution was preferable. The first feature
indicated that the three factors are not distinct, although they have been described as such
in factor analytical studies (e.g. Spinella, 2007). The current study questions this and
suggests instead that the factors simply represent related components of a higher order
construct (i.e. impulsivity). Indeed, the second order model reported indicated that the
three factors were underneath a single higher order factor of ‘impulsivity’. Such a model
could not be tested for women since there were only two first order factors (with a
minimum of three factors required). However, the results suggest that using the higher
order factor of ‘impulsivity’ may be preferable to adopting an individual factor approach.
This is an important point in that there does appear to be distinction between some
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schools of study, with those focusing on aggression per se preferring to utilise the BIS-11 as a unidimensional measure whereas those focusing on general delinquency (including substance use, and gambling etc) focus on factors. The current study suggests there may be value in using the BIS-11 both as a unidimensional and a multidimensional measure although it cannot be assumed that the three factor solution proposed by Patton et al (1995) will automatically transfer. This appears to particularly be the case for women.

Evidence for a different structure for men and women was not consistent with the prediction that the multidimensional structure of the BIS-11 would be replicated between sex. Although a three-factor solution was a good fit for men, it was not for women. For women, the factor ‘distractibility’ required removal before an acceptable fit could be indicated. Thus for men, although there are components of behaviour, cognition and planning skills evident, for women impulsivity is better described as comprising behaviour and planning skills. This does query the potential value in using impulsivity as a mediator between variables, such as using it to attempt to explain differences in aggression and sex (Campbell, 2006), and delinquency and sex (Rowe, Flannery & Flannery, 1995). The current indicates that impulsivity does not present in a uniform fashion between sex. The failure to reliably confirm a factor structure for women in the current study may indicate that the BIS-11 has failed to adequately account for the possibility of sex differences in impulsivity.

The current study is not, however, without its limitations. First, although the analyses included both exploratory and testing (confirmatory) analyses, it was correlational in nature with a self-selecting sample that had opted-in to complete the measure with no incentives for engagement offered. Second, although there was
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evidence of internal reliability with the BIS-11, the extent to which it is ecologically valid is an issue which falls outside the scope of the current study, but would be worthy of further investigation.

The current study does illustrate, however, that the BIS-II is an internally reliable measure when applied to a sample where impulsivity is expected to be at elevated levels. However, the current study questions the structure of impulsivity. This finding has important implications beyond the population used here to illustrate the problems in concept structure. Impulsivity has been used as a mediating variable to describe sex differences in aggression (Campbell, 2006), to describe delinquency, eating disorders, psychopathy, distress, substance use (Whiteside & Lynam, 2001) and dyslexia (Baker & Ireland, 2007), to name but a few. The argued components of impulsivity have also been used to describe the processes underlying various maladaptive behaviours, such as compulsive buying (Billieux et al, 2008). What the current study suggests, is that the concept of impulsivity presents with structural difficulties in measurement, and that although there is some evidence of heterogeneous qualities (i.e. a multi-dimensional structure), the actual components are unclear, making it difficult to find a common nosology across samples (Whiteside & Lynam, 2001).

The current study also illustrates the importance of exploring and confirming measure structure, rather than assuming that a published structure with automatically apply (e.g. Spinella, 2007). This is a criticism which can be leveled at a range of impulsivity measures, and not just the BIS (e.g. Billieux et al, 2008). Indeed, impulsivity as a concept is poorly defined and thus it cannot be assumed that the factors proposed in any published measures are fixed, particularly when there has been almost a complete
absence of attempts to rigidly explore and confirm structure using more refined analyses, such as confirmatory factor analysis. In essence this is perhaps the wider scientific relevance of the current study: there is a need for researchers to assure themselves more of the structure of the measures that they are employing, particularly if these are argued to comprise factors, and not simply assume factor presence following a simple exploratory structure analysis. A valuable focus for future research, therefore, would be the further development and refinement of measures of impulsivity, extending this to focus on assessing the structural validity of measures overall and any suggested components of such measures.
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Footnote

1The data was derived from a larger dataset exploring aggression and prison bullying. The results of these studies can be found in Ireland, Archer & Power (2007) and Archer, Ireland & Power (2007). The present study, however, is wholly unconnected with the issues addressed in these previous articles. The first paper makes no mention of impulsivity and the second mentions level of impulsivity across the variables of interest i.e. aggression and bullying. No exploration of the BIS data is conducted.

2For completeness, models were also conducted without the use of item parcels, i.e. with individual BIS-11 items instead. For men and women, resulting model fit converged with those employing item parcels (i.e., Men; RMSEA = .05; GFI = .91; CFI = .93; ECVI = 1.20; Women; RMSEA = .065; GFI = .91; CFI = .92; ECVI = .93).

3The three factor model for men was also tested as a second-order model [hierarchical confirmatory factor analysis] to determine if the three factors proposed were underneath a single order factor. The resulting model was a good fit, virtually identical to the first (n = 250: Study III: $X^2 = 32.2$, df = 24, $p = .04$; RMSEA = .047; GFI = .96; CFI = .98; ECVI = .32). A second-order model could not be explored for women as there are only two first-order factors, with a minimum of three required for identification.
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Figure I. Confirmatory Factor Analysis of the BIS-11 factor structure using adult men prisoners (n = 383: Study I: RMSEA = .09; GFI = .77; CFI = .63; ECVI = 3.82).
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Figure II. Confirmatory Factor Analysis of the BIS-11 factor structure using adult women prisoners (n = 250: Study II: RMSEA = .09; GFI = .75; CFI = .62; ECVI = 4.75).
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Figure 3. Confirmatory Factor Analysis of the BIS-11 factor structure using adult men prisoners\(^3\) (n = 250: Study III: RMSEA = .047; GFI = .97; CFI = .98; ECVI = .32)*.

*Cog = Cognitive Planning Skills; Distract = Distractability; Beh = Behavioural Impulsivity. Variances are shown above parcel items and standardized regression weights below.
Figure 4. Confirmatory Factor Analysis of the BIS factor structure using adult women prisoners\(^3\) (n = 220: Study IV: RMSEA = .09; GFI = .96; CFI = .96; ECVI = .23).

*Cog = Cognitive Planning Skills; Beh = Behavioural Impulsivity. Variances are shown above parcel items and standardized regression weights below.
Table 1

Exploratory factor analysis of BIS-11 for men and women prisoners (n = 633) (NB: Factor loadings are rounded to two decimal places). Items in bold are least likely to form part of the specific factor with loadings below .50.

<table>
<thead>
<tr>
<th>Factor 1 (19.9% variance).</th>
<th>Original BIS factor</th>
<th>Factor loading</th>
<th>Parcel Factor/Current study factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Planning Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 items α = .85; 10 items α = .86*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am a careful thinker</td>
<td>Attentional</td>
<td>.76</td>
<td>F1/1</td>
</tr>
<tr>
<td>I am a steady thinker</td>
<td>Attentional</td>
<td>.76</td>
<td>F1/1</td>
</tr>
<tr>
<td>I concentrate easily</td>
<td>Attentional</td>
<td>.71</td>
<td>F1/1</td>
</tr>
<tr>
<td>I am self-controlled</td>
<td>Motor</td>
<td>.66</td>
<td>F1/2</td>
</tr>
<tr>
<td>I plan tasks carefully</td>
<td>Non-planning</td>
<td>.66</td>
<td>F1/1</td>
</tr>
<tr>
<td>I finish what I start</td>
<td>Non-planning</td>
<td>.64</td>
<td>F1/2</td>
</tr>
<tr>
<td>I plan trips well ahead of time</td>
<td>Non-planning</td>
<td>.62</td>
<td>F1/2</td>
</tr>
<tr>
<td>I save regularly</td>
<td>Non-planning</td>
<td>.59</td>
<td>F1/2</td>
</tr>
<tr>
<td>I like to think about complex problems</td>
<td>Attentional</td>
<td>.56</td>
<td>F1/3</td>
</tr>
<tr>
<td>I plan for the future</td>
<td>Non-planning</td>
<td>.52</td>
<td>F1/3</td>
</tr>
<tr>
<td><strong>I have regular medical/dental check ups</strong></td>
<td>Non-planning</td>
<td><strong>.41</strong></td>
<td>F1/3</td>
</tr>
</tbody>
</table>

Table 1 continues
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<table>
<thead>
<tr>
<th>Factor 2 (14.1% variance)</th>
<th>Behavioural Motor Impulsivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 items $\alpha = .76$; 4 items $\alpha = .74^*$</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>I act on the spur of the moment</td>
<td>Motor</td>
</tr>
<tr>
<td>I act “on impulse”</td>
<td>Motor</td>
</tr>
<tr>
<td>I do things without thinking</td>
<td>Motor</td>
</tr>
<tr>
<td>I buy things on impulse</td>
<td>Motor</td>
</tr>
<tr>
<td>I spend or charge more than I earn</td>
<td>Non-planning</td>
</tr>
<tr>
<td>I say things without thinking</td>
<td>Motor</td>
</tr>
<tr>
<td>I am more interested in the present than the future</td>
<td>Non-planning</td>
</tr>
<tr>
<td>I change jobs</td>
<td>Non-planning</td>
</tr>
<tr>
<td>I have “racing” thoughts</td>
<td>Attentional</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor 3 (4.6% variance)</th>
<th>Distractability</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 items $\alpha = .66$; 4 items $\alpha = .60^*$</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>I find it hard to sit still for long periods of time</td>
<td>Motor</td>
</tr>
<tr>
<td>I have outside thoughts when thinking</td>
<td>Attentional</td>
</tr>
<tr>
<td>I talk fast</td>
<td>Motor</td>
</tr>
<tr>
<td>I am restless in class/groups</td>
<td>Motor</td>
</tr>
<tr>
<td>I get easily bored when solving thought problems</td>
<td>Attentional</td>
</tr>
<tr>
<td>I walk and move fast</td>
<td>Motor</td>
</tr>
</tbody>
</table>

*all item-to-total correlations were positive