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Testing the fear and anxiety distinction in the BIS/BAS scales in community and heroin-dependent samples

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### Abstract

Gray's Reinforcement Sensitivity Theory (RST) is one of the most influential contemporary theories of personality applied to the study of psychopathology. However, recent revisions to the theory have implications for known associations between personality vulnerabilities and psychopathology when using measures based on the original theory. A proposed restructuring of a commonly used measure of the original RST, the BIS/BAS scales, as a proxy measure of the revised theory has met with some support in English-speaking countries. We sought to test the robustness of the new structure in a large non-English-speaking community sample ( $N = 968$ ) and a heroin-dependent sample ( $N = 302$ ). Results of exploratory and confirmatory factor analysis supported the proposed 5-factor solution comprising of two "BIS" factors (BIS-Anx and BIS-Fear) and three BAS factors (Drive, Reward responsiveness, Fun seeking) as the best fitting model for both community and heroin-dependent. However, this model showed considerable ill-fit in both samples. These findings support calls for the development of new measures consistent with the revised RST for use in applied research.

### Keywords

BIS/BAS; RST; heroin; clinical; community; psychometric

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## 1. Introduction

Since its original description, Gray's Reinforcement Sensitivity Theory (RST) has been one of the most researched and reviewed theories of personality (Gray, 1970). In its most recent revision, RST consists of three biologically-mediated motivational systems: i) a Behavioural Approach System (BAS), which underpins individual differences in reward sensitivity in the presence of desired goals and anticipation of goal attainment leading to approach behaviour; ii) a Fight, Flight, Freeze System (FFFS), which is involved in punishment sensitivity, detecting threat and the tendency to avoid conditioned and unconditioned aversive stimuli; and iii) a Behavioural Inhibition System (BIS), which is involved in the detection and resolution of conflicts between the BAS and the FFFS when the individual is presented with inputs from both systems (Gray & McNaughton, 2000). Whilst approach-avoidance conflicts are the most typical conflicts, the BIS also detects and resolves approach-approach conflicts and avoid-avoid conflict (Corr, 2004). These motivational systems may be seminal for the shaping and encoding of developmental experiences, which influence functional outcomes (i.e., behavioural response, personality trait descriptors) in response to appetitive and aversive stimuli.

The utility of these systems in explaining a range of psychopathologies has been widely endorsed by applied researchers (Bijttebier, Beck, Claes, & Vandereycken, 2009). For example, anxiety is associated with high BIS reactivity, depression with both high BIS and low BAS reactivity, and psychopathy with a combination of low BIS and high BAS (although there is some debate regarding whether low or high BIS is specific to certain subtypes of psychopathy; see Bijttebier et al. for a comprehensive review). One area in which RST has been fruitfully applied is in the study of addiction where high BAS reactivity is consistently associated with alcohol and drug use, but where there is considerable inconsistency in the

association of BIS and substance use, with some studies finding no association and others finding low BIS in substance abusing populations (Franken, Muris, & Georgieva, 2006; Loxton et al., 2008). Although, the BAS has remained relatively unchanged in the revised theory, the demarcation of FFFS and BIS may assist in further understanding such inconsistent results. Given the substantial changes to the theory and potential implications of the revisions for the study of psychopathology directly associated with functioning of anxiety and fear (e.g., phobic disorders, panic disorders) and the paucity of new measures of the revised theory, attention now focuses on whether previous measures of RST (notably “BIS” related scales) can and should be used as proxy measures of the revised theory.

One of the most frequently used measures based on the original theory is Carver and White's (1994) BIS/BAS scales. This questionnaire comprises 20 four-point Likert-type items that derive a global BIS score and three BAS-related subscale scores. The BIS scale elicits respondents' reactions to cues of impending punishment, while the BAS scale yields three subscales scores: including items regarding persistence in obtaining desired goals (Drive; BAS-Drv), statements indicative of a willingness to seek out and spontaneously approach potentially rewarding experiences (Fun Seeking; BAS-FS), and items measuring anticipation and positive response towards reward (Reward Responsiveness; BAS-RR). The BIS/BAS scales have been the most translated measure of the original RST now covering a range of European and (to a far lesser extent) Asian languages (e.g., Loxton, et al., 2008; Müller & Wytykowska, 2005). The 4-factor structure of this instrument, when translated, remains unchanged although internal reliability estimates tend to be lower than those of the English version with alphas ranging from .58 (Müller & Wytykowska, 2005) to .82 (Dissabandara, Loxton, Dias, Daghish, & Stadlin, 2011).

While there was minimal change to the conceptualisation of the BAS dimension (although see Jackson, 2009) the validity and utility of the BIS scale as proxy measures of the

revised BIS and FFFS has been of particular interest to RST researchers. Corr and McNaughton (2008) proposed that the seven items of the BIS scale may be decomposed into items that assess fear and others that assess anxiety. For example, Johnson, Turner, and Iwata (2003) found two items from the BIS scale: “Even if something bad is about to happen to me, I rarely experience fear or nervousness” and “I have very few fears compared to my friends” to load on a separate factor from the other five BIS items and interpreted as potentially assessing FFFS (BIS-Fear) rather than the revised BIS (BIS-Anxiety). Heym, Ferguson and Lawrence (2008) subsequently suggested the inclusion of the item “If I think something unpleasant is going to happen I usually get pretty worked up” as a third BIS-Fear item. Heym et al. tested three competing structural models of the BIS scale: i) a single BIS factor model with all seven BIS items from the original scale (referred to as the “Carver & White 1994 model”), ii) a two-factor BIS model with the two BIS-Fear items found by Johnson et al. (referred to as the “Johnson et al, 2003 model”) and iii) a two-factor BIS model with the three BIS-Fear items (referred to as the “Heym et al., 2008 model”). The results supported a two-factor BIS scale with three BIS-Fear items and five BIS-Anxiety items (i.e., the “Heym et al 2008 model”) having the best fit of the three models.

However, when testing the structure of the BIS scale in conjunction with the BAS scales, the two-item BIS-Fear scale (i.e., the Johnson et al., 2003 model) was supported (Beck, Smits, Claes, Vandereycken, & Bijttebier, 2009; Johnson, et al., 2003; Poythress et al., 2008). In part the difference in support for the 3-item and the 2-item BIS-Fear scale may reflect differences in the samples used: Poythress et al., 2008 used a sample of offenders and Beck et al., 2009 used a sample of patients with eating disorders, while Heym et al., 2008 used a university student sample. It is possible that the additional item is a less valid measure of fear in clinical samples. To our knowledge, no study has explicitly tested the two proposed 5-factor models (using both the 2- and 3-item BIS-Fear scale) in a non-clinical

sample. Moreover, to date a non-English version has not been tested. This is important as applied researchers across a range of countries look to measures that successfully assess the revised RST.

Given the revision of RST and the relative lack of purpose-built measures (at least until recently, e.g., Jackson, 2009) and that the BIS/BAS scale have been translated into a host of languages, the aim of the current study was to test the two versions of the 5-factor BIS/BAS scales of a Sinhalese (Sri Lankan) version of the scale using i) a large community sample of men and women and ii) a clinical sample of dependent heroin users.

## 2. Method

### 2.1 Participants

We recruited a community sample of 968 Sri Lankans (65% male) with the ability to read and understand Sinhalese with the help of welfare organizations of villages, businesses, schools, university and government organizations. Participants were from a wide range of social backgrounds including students, medical officers, teachers, clerical staff, businessmen, labourers, police and security personnel, executives and retired workers. The mean age was 24.8 years ( $SD = 10.1$ ). The second group comprised 306 Sri Lankan male heroin users who fulfilled the DSM -IV criteria for opioid dependence, recruited from a rehabilitation centre. The mean age of this sample was 33.9 years ( $SD = 7.8$ ).

### 2.2 Measure

We used the Sinhalese version of the BIS/BAS scales which consists of 24 items: 20 items measuring the three BAS-related scales; BAS-RR, BAS-FS, BAS-Drv, the two BIS/FFFS-related scales; BIS-Fear, BIS-Anxiety, plus four filler items (Dissabandara, et al., 2011). Each item was scored using a four point Likert scale, ranging from 1 (strongly agree) to 4 (strongly disagree) and re-scored when calculating scale scores such that a high score is indicative of a higher level of the trait. Only the 20 BIS/BAS items were included in the

analyses. Dissabandara et al., 2011 found adequate internal consistency for the three BAS scales with Cronbach alphas from .73 - .82 although the BIS scale alpha was low .62 in a university sample.

### 2.3 Procedure

The BIS/BAS questionnaire was given to participants to complete in large groups under the direct supervision of a team of research assistants as part of a larger genetic association study. Ethical approval was obtained from the committee of research and ethical review of the Faculty of Medicine, University of Peradeniya and written informed consent was obtained from all participants.

### 2.4 Statistical Analyses

As there have been several competing models published we decided to perform an exploratory factor analysis (EFA) of the BIS/BAS. Similar methods have been used in previous studies testing this structure (e.g., Poythress et al., 2008). A randomised sub-sample of 504 participants from the community sample was selected for the EFA. A Principal Component Analysis using a direct oblimin rotation was used to derive the factor structure. An oblique rotation was chosen as previous studies have found moderate intercorrelations between the BIS-Anx and BIS-Fear scales and between the BAS subscales (e.g., Beck et al., 2009, Heym et al., 2008, Poythress et al., 2008). EFA was followed by confirmatory factor analyses (CFA) on the remaining sub-sample of the community sample ( $n = 464$ ) testing the following four models: 1) a two-factor BIS/BAS model, 2) a four-factor “Carver and White” model (BAS-FS/BAS-Drv/BAS-RR/BIS), 3) a five-factor “Johnson et al” model (BAS-FS/BAS-Drv/BAS-RR/5-item BIS-Anx/2-item BIS-Fear) and 4) a five-factor “Heym et al.” model (BAS-FS/BAS-Drv/BAS-RR/4-item BIS-Anx/3-item BIS-Fear). These four models were subsequently tested in a sample of heroin-dependent men to assess the replication of the models in a clinical sample. This sample was chosen as substance dependence has been a key

area of research using RST (e.g., Loxton et al., 2008), yet little psychometric examination of measures has been used in these populations.

CFA models were tested using AMOS 18 statistical software (Arbuckle, 2009). All items were forced to load only on their respective factors and factors were allowed to covary as per previous studies finding moderate correlation between the factors (e.g., Poythress et al., 2008). Covariance matrices were analysed using Maximum Likelihood Estimation. Multiple indices were used to evaluate model fit. The chi-square ( $\chi^2$ ) goodness of fit index statistic, Root Mean Squared Error of Approximation (RMSEA), Comparative Fit Index (CFI), Adjusted Goodness of Fit Index (AGFI) and Standardised Root Mean Residual (SRMR) were used to test for fit between the observed and implied variance-covariance matrices. For a fit to be acceptable, RMSEA and SRMR should be  $< 0.06$  and  $< 0.08$  respectively, and CFI and AGFI  $> 0.90$  (Hu & Bentler, 1999). As the two-factor, four-factor and the five-factor models are nested, a  $\chi^2$  difference test was conducted to test relative fit. As the two five-factor models are not nested the  $\chi^2$  difference test is inappropriate and the difference between the two was assessed using Akaike Information Criteria (AIC) with a lower AIC suggestive of better fit. Subscale inter-correlations and internal consistency were assessed using SPSS 18.

### 3. Results

#### 3.1 Data screening

Less than 5% data were missing and were estimated using the expectation maximum algorithm. All scales were normally distributed for both community samples with no evidence of skew or univariate outliers. All scales with the exception of the BIS total and BIS-Anx were normally distributed for the heroin use sample. The BIS total and BIS-Anx were mildly negatively skewed with no evidence of univariate outliers. Multivariate outliers were examined using Mahalanobis distance and were removed, leaving 498 in community



sub-sample 1 (for EFA) and 458 in community sub-sample 2 (for CFA) and 302 in the heroin-dependent sample.

### 3.2 Exploratory factor analysis of the first sub-sample of the community cohort

Kaiser-Meyer-Olkin (KMO) index (0.78) and Bartlett's test of sphericity  $\chi^2(190) = 2273, p < .001$  indicated there were sufficient inter-correlations in the data to proceed with Principal Components Analysis. The EFA yielded five components according to Kaiser's criteria of Eigenvalues above 1, accounting for 54% of the variance in the data. Examination of the scree plot also suggested a five-component solution. The factor loadings of BIS/BAS items after rotation are shown in Table 1. Although the five factor solution was somewhat consistent with that obtained by Heym et al. it is noteworthy that the "BIS-Anx" item "I feel pretty worried or upset when I think or know somebody is angry at me" loaded on the BIS-Fear component while the item "I have very few fears compared to my friends" cross-loaded on both BIS-Fear and BIS-Anxiety components. All BAS items loaded on their expected components.

### 3.3 Confirmatory factor analysis

The results of the CFA analyses using the second community sub-sample and the sample of dependent heroin users are given in the Table 2. As shown, multiple fit indices for the two-factor model for the community sample were not acceptable. The four-factor model was a significantly better fit to the data compared to the two-factor model ( $\chi^2_{\text{diff}}(5) = 533.61, p < .001$ ). However, overall indices of fit were poor. The five-factor "Johnson" model was not a significant improvement on the typical four-factor Carver and White (1994) model. AIC indicated that, Heym et al.'s 5-factor model (AIC = 527) was a better fit for the data than Johnson et al.'s 5-factor model (AIC = 537). The 5 factor model as described by Heym et al., 2008 was the best fitting model for the data compared to both the two factor ( $\chi^2_{\text{diff}}(9) =$

550.66,  $p < .001$ ) and the four factor models ( $\chi^2_{\text{diff}}(4) = 16.87, p < .01$ ). However, the fit indices suggested generally poor fit to the data.

The CFA of the heroin-dependent sample revealed similar results to the community sample with the Heym et al. five-factor model being a significantly better fit to the data compared to the two-factor ( $\chi^2_{\text{diff}}(9) = 325.25, p < .001$ ), the four-factor models ( $\chi^2_{\text{diff}}(4) = 83.54, p < .001$ ) and Johnson et al.'s 5-factor model (476 vs 555, respectively). Again, the fit of this model was poor with all fit indices below the recommended cutoffs. Given the slight skew for the BIS-Anxiety scale bootstrapping was performed to assess whether skew played an undue influence on model fit. However, there was little change to overall model fit or factor loadings when correcting for skew.

#### 3.4 Internal consistency and correlations among BIS and BAS subscales

Cronbach's alpha values and the results of bivariate correlation among BIS/BAS subscales in both the community (CFA sample) and heroin-dependent samples are shown in Table 3. As shown, the alpha values of BAS subscales for the community group were higher compared to BIS subscales and the total BIS scale. The total BIS and the two BIS-Anx/BIS-fear were very low. In the heroin sample, the BIS-Anxiety and BIS-total scales showed acceptable internal consistency while the BIS-Fear scale was extremely poor. Investigating the low internal consistency in this sample, it was found that the question "I have very few fears compared to my friends" was negatively associated with the total BIS-Fear score ( $r = -.21$ ). The three BAS scales were also lower than considered desirable although similar to previous studies (e.g., Müller & Wytykowska, 2005). As previously found, in both samples the two BIS subscales positively correlated with each other, as were the 3 BAS scales. In addition, BIS-Anxiety was significantly positively correlated with BAS-RR in both the community and heroin-dependent samples.

#### 3.5 Group differences

The heroin-dependent group were significantly more reward sensitive than the community group while there was no difference on the total BIS, nor on the BIS-Anxiety or BIS-Fear scales.

#### 4. Discussion

In this study we examined the factor structure of Carver and White's BIS/BAS scale in a community and a clinical sample from a non-English speaking population (Sinhalese). While the 5-factor structure as proposed by Heym et al., 2008 showed the better fit relative to a two-factor and four-factor structure in community and heroin samples, indices of overall fit and internal consistency were low and suggest problems with using this scale as a measure of the revised RST, at least when translated. We discuss these issues in detail below.

Consistent with recent findings, we observed a 5-factor solution as a better fit for our data using both exploratory and confirmatory approaches in both community and clinical samples (Beck et al., 2009, Johnson et al., 2003, Poythress et al., 2008). Whilst we replicated Heym et al.'s (2008) findings of a BIS-Fear subscale consisting of three items in the community sample and found this to be a superior fit to the other tested models, the Heym et al model still showed considerable ill-fit with the data. While we may consider the ill-fit to potentially be due to the use of a translated measure, we note that we previously found adequate fit in a sample of Sri Lankan university students using the same measure. However, we did find the same problematic BIS-fear item "I have few fears compared to my friends" in the current sample to also be problematic in the Sri Lankan university sample. This suggests that this item may not be a valid or reliable measure of fear/BIS in the Sinhalese language.

In accord with poor fit, the alpha value of the BIS-Fear scale was very low in both samples. However, this is consistent with two of the three previous studies reporting low alpha levels for the BIS-Fear scale (.63, Beck et al., 2008 & .54, Keiser & Ross, 2011). Furthermore, while the internal consistency of the total BIS scale was acceptable in the

heroin group (as was the BIS-Anxiety subscale) it was low in the community sample. It could be claimed that a low BIS total alpha simply reflects the existence of the two separate BIS-Anxiety and BIS-Fear factors as found in the EFA/CFAs. This is supported by the much lower inter-correlation between the two BIS subscales in the community sample and the much higher correlation between the two scales in the heroin sample. This suggests that the two constructs (fear and anxiety) are more closely aligned (at least in terms of self-report) in the heroin sample than in the community sample. However, we also note similarly high inter-correlations in other non-clinical samples (e.g.,  $r = .5$ , Heym et al., 2008,  $r = .54$ , Keiser & Ross, 2011) and in an eating disorder sample ( $r = .68$ , Beck et al., 2009). This raises questions as to the distinction between fear and anxiety, particularly in clinical populations.

Mean scores on BAS scales and the total BIS scale were similar those found in previous studies using translated scales (Loxton et al., 2008, Dissabandura et al., 2011). As typically found, heroin-dependent participants scored significantly higher on the BAS scales than the community group (Loxton et al., 2008, Franken, et al., 2006). The lack of difference on the BIS scale reflects the lack of difference between drug-using and community samples found in some studies (e.g., Franken et al.), but not others in which drug-dependent groups were significantly higher (e.g., Loxton et al.). Again, this reflects the literature on the inconsistent association between BIS and drug use.

This study sought to investigate the potential for the parsing of the BIS scale into a Fear and Anxiety component to assess the utility of the revised RST in the study of psychopathology. This is of particular importance as according to the revised theory the FFFS and BIS systems have distinct behavioral, emotional and motivational outputs: FFFS-mediated fear motivates movement away from danger (defensive avoidance), while r-BIS-mediated anxiety motivates cautious movement toward potential danger (defensive approach, McNaughton & Corr, 2004; Perkins, Kemp, & Corr, 2007). However, as demonstrated here,

whilst admirable attempts have been made to modify measures of the old RST to offer proxy measures of both r-BIS and FFFS, this restructuring still shows a number of psychometric problems. In part, this may be due to the original BIS scale being limited in items assessing approach behavior in light of threats that cannot be avoided (BIS-mediated behaviour) and avoidance of those that can (FFFS-mediated behaviour) as dictated by the revised theory. We reiterate the conclusion of Poythress et al. (2008) that the original BIS scale captures anxiety and negative affect but not fear. Indeed, in this study the BIS-fear scale was the most problematic of the scales.

To that end, we endorse the development of new measures explicitly designed to assess the revised theory. At least one new scale has been developed to fill this gap (Jackson, 2009) and the use of threat scenarios are also proving an alternative method to assessing the revised theory (Perkins & Corr, 2006; Perkins, et al., 2007). Such approaches could very easily be incorporated in future applied research such as the study of addictive processes. At the very least, caution should be taken when interpreting results using existing BIS items as indices of fear.

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Table 1

*Results of Principle Components Analysis of the community sub-sample 1 (N = 504) using an oblimin rotation*

	Component				
	1	2	3	4	5
<b>BIS-Anxiety</b>					
8. Criticism or scolding hurts me quite a bit	-.07	.28	-.03	.14	<b>-.55</b>
13. I feel pretty worried or upset when I think or know somebody is angry at me	.27	<b>.43</b>	.03	-.22	-.29
19. I feel worried when I think I have done poorly at something important	.16	.01	.01	-.15	<b>-.59</b>
24. I worry about making mistakes.	-.10	.01	-.02	.11	<b>-.73</b>
<b>BIS-Fear</b>					
2. Even if something bad is about to happen to me, I rarely experience fear or nervousness	.03	<b>.67</b>	-.02	-.01	-.11
22. I have very few fears compared to my friends	-.10	<b>.66</b>	.02	.03	<b>.53</b>
16. If I think something unpleasant is going to happen I usually get pretty “worked up”	.03	<b>.60</b>	.08	-.01	-.27
<b>BAS-Drv</b>					
3. I go out of my way to get things I want	-.09	.04	-.03	<b>.80</b>	.02
9. When I want something I usually go all-out to get it.	.07	.04	.04	<b>.83</b>	.03
12. If I see a chance to get something I want I move on it right away	.06	.04	.06	<b>.67</b>	-.03
21. When I go after something I use a “no holds barred” approach	.06	-.35	.04	<b>.50</b>	-.17
<b>BAS-FS</b>					
5. I’m always willing to try something new if I think it will be fun	.03	-.03	<b>.72</b>	.13	-.05
10. I will often do things for no other reason than that they might be fun	.03	-.09	<b>.72</b>	-.09	.07
15. I often act on the spur of the moment	.08	.24	<b>.67</b>	.04	.00
20. I crave excitement and new sensations	.05	-.10	<b>.79</b>	.01	-.02
<b>BAS-RR</b>					
4. When I’m doing well at something I love to keep at it	<b>.68</b>	-.12	-.09	.15	.09
7. When I get something I want, I feel excited and energized	<b>.67</b>	.20	.02	.10	-.07

14. When I see an opportunity for something I like I get excited right away	<b>.70</b>	.20	.02	.11	.08
18. When good things happen to me, it affects me strongly	<b>.73</b>	-.07	-.05	-.04	-.07
23. It would excite me to win a contest	<b>.70</b>	-.04	.18	-.02	.05

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*Note.* Coefficients greater than .4 are in Bold. All communalities were above .4.

Table 2

*CFA models of the community sub-sample 2 and the sample of dependent heroin users*

Model	$X^2$ (df)	chn $X^2$ (df)	SRMR	AGFI	CFI	RMSEA	AIC
<b>Community (n=458)</b>							
2 Factor	977.94 (169)	--	0.09	0.75	0.58	0.10	1060
4 Factor	444.15 (164)	534 (5)*	0.07	0.89	0.85	0.06	536
5 Factor (Johnson)	437.27 (160)	7 (4) <sup>a</sup>	0.06	0.89	0.85	0.06	537
5 Factor (Heym)	427.28 (160)	17 (4) <sup>b*</sup>	0.06	0.89	0.86	0.06	527
<b>Heroin-dependent (n=302)</b>							
2 Factor	701.60 (169)	--	0.08	0.75	0.68	0.10	784
4 Factor	459.89 (164)	242 (5)*	0.06	0.83	0.82	0.08	552
5 Factor (Johnson)	455.36 (160)	5 (4) <sup>a</sup>	0.06	0.83	0.82	0.08	555
5 Factor (Heym)	376.35 (160)	79 (4) <sup>b*</sup>	0.06	0.86	0.87	0.07	476

*Note.* SRMR = Standardised Root Mean Residual, AGFI = Adjusted Goodness of Fit Index,

CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, AIC =

Akaike's Information Criterion. <sup>a</sup> 5 Factor (Johnson) model compared with 4 factor model <sup>b</sup> 5

Factor (Heym) model compared with 4 factor model

Table 3

*Internal consistency, inter-scale correlations and means in the community (CFA) and heroin samples*

Inter-scale correlations (Pearson's r)						
	BIS-Anxiety	BIS-Fear	BAS-RR	BAS-FS	BAS-Drv	BIS (Total)
BIS-Anxiety		.51**	.15*	.10	.06	.93***
BIS-Fear	.28**		.04	.08	-.02	.78***
BAS-RR	.17***	-.01		.15**	.39**	.12*
BAS-FS	.02	.01	.22**		.29**	.10
BAS-Drv	.05	-.08	.39**	.32**		.04
BIS (Total)	.86***	.73***	.11	.02	-.01	
Scale consistency (Cronbach's $\alpha$ )						
Community	.54	.35	.70	.77	.78	.56
Heroin	.82	.17	.69	.69	.62	.76
Scale Means (SD)						
Community	11.75 (1.96)	7.72 (1.51)	15.65 (2.28)	9.95 (2.38)	11.27 (2.37)	19.46 (2.79)
Heroin	11.87 (2.60)	7.91 (1.48)	16.72*** (2.22)	12.17*** (2.10)	12.56*** (2.10)	19.79 (3.62)

*Note.* Scale consistency values are for the Heym's 3-item BIS-Fear and the 4-Item BIS-

Anxiety factors. The BIS (total) scale is the original 7-item BIS scale. Heroin sample data is presented above the diagonal; Community sample (CFA) data presented below the diagonal.

\*\*\* heroin-dependent significantly different from community.