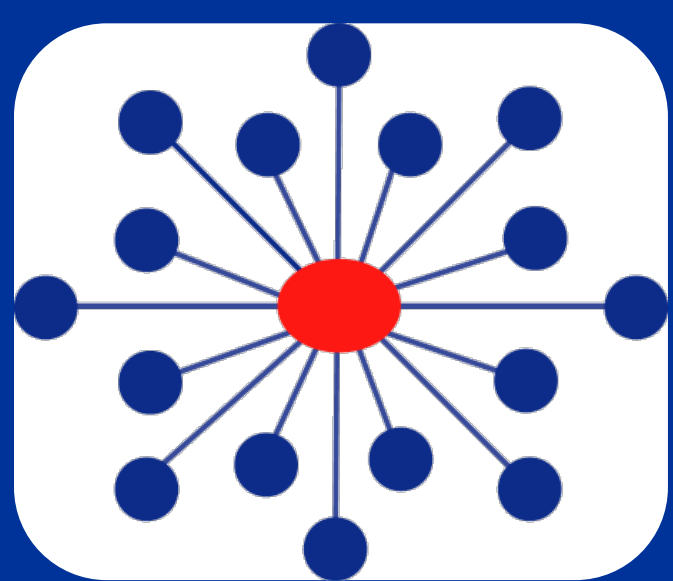




FAILURE TO LOOK BEFORE LEAPING: THE BARRATT IMPULSIVENESS SCALE PREDICTS TREATMENT COMPLETION IN COCAINE- AND METHAMPHETAMINE-DEPENDENT PATIENTS



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ABSTRACT

Aims: Greater impulsivity as assessed by the Barratt Impulsiveness Scale-11 (BIS-11) and the Stroop has been associated with treatment outcomes in patients with stimulant use disorders. The present study evaluated the relationships among impulsivity, baseline stimulant use status, and treatment outcomes in methamphetamine- and/or cocaine-dependent participants. **Methods:** Six sites participating in a multi-site clinical trial evaluating 12-step facilitation for stimulant abusers (STAGE-12) obtained the Stroop and BIS-11 from 183 methamphetamine- and/or cocaine-dependent participants. The relationships of the BIS-11 and Stroop to baseline stimulant use and treatment outcomes through 6-month follow-up were evaluated. **Results:** Methamphetamine-dependent, relative to cocaine-dependent, participants evidenced greater impulsivity as measured by BIS-11 Total score ($X^2=6.6$; $p=0.01$). There was a trend for poorer response inhibition, as measured by the Stroop, in cocaine-dependent, relative to methamphetamine-dependent, participants ($X^2=3.5$; $p=0.06$). When accounting for other factors related to treatment completion, the BIS-11 Motor Impulsiveness score, which assesses the tendency to act without thinking, was predictive of treatment completion status ($d=0.52$, $p=0.001$). No relationship greater than $r=0.2$ was observed between impulsivity and stimulant use during either baseline or treatment/ follow-up. **Conclusions:** BIS-11 Motor Impulsiveness was a significant predictor of treatment retention. Treatment-seeking methamphetamine and cocaine-dependent patients may have different impulsivity profiles.

INTRODUCTION

- Greater impulsivity as assessed by the Barratt Impulsiveness Scale-11 (BIS-11) and the Stroop has been associated with treatment non-completion in patients with stimulant use disorders¹⁻⁴
- Impulsivity has not been predictive of stimulant use outcomes; may be associated with recent use¹
- Past research has been primarily with cocaine-dependent participants and in single-site studies
- Present study evaluated the relationships among impulsivity, stimulant use, and treatment completion in methamphetamine- and/or cocaine-dependent patients participating in a multi-site clinical trial

METHODS

Participants

- 183 adults meeting DSM-IV criteria for cocaine and/or methamphetamine dependence
- Participated in a multi-site clinical trial evaluating 12-step facilitation for stimulant abusers with an 8 week active treatment phase and 3 and 6 month follow-ups⁵

Assessments

Baseline characteristics

- Wender Utah Rating Scale (ADHD)⁶
- Patient Health Questionnaire (Mood Disorders)⁷

Impulsivity

- BIS-11⁸
- Comalli-Kaplan Stroop Color Word test⁹

Treatment completion

- Completers were defined a priori as those who attended the first 5 weeks of treatment without missing two or more consecutive weeks.

Stimulant use

- Self-report from Timeline Follow-Back¹⁰
- Qualitative urine drug screens (UDS)

Data Analysis

- *Baseline stimulant use:* normal regressions used; for methamphetamine and cocaine-dependent comparisons, corrected Akaike Information Criteria (AICC) used to test inclusion of covariates on which samples differed significantly (Table 1) with the exception of race and sites due to confounding with stimulant-dependence diagnosis
- *Treatment outcomes:* normal regressions used; for treatment completion comparisons, AICC used to test inclusion of covariates on which samples differed significantly at baseline (Table 1)
- Relationship of impulsivity to stimulant use during treatment and follow-up evaluated with Pearson correlation coefficients

RESULTS

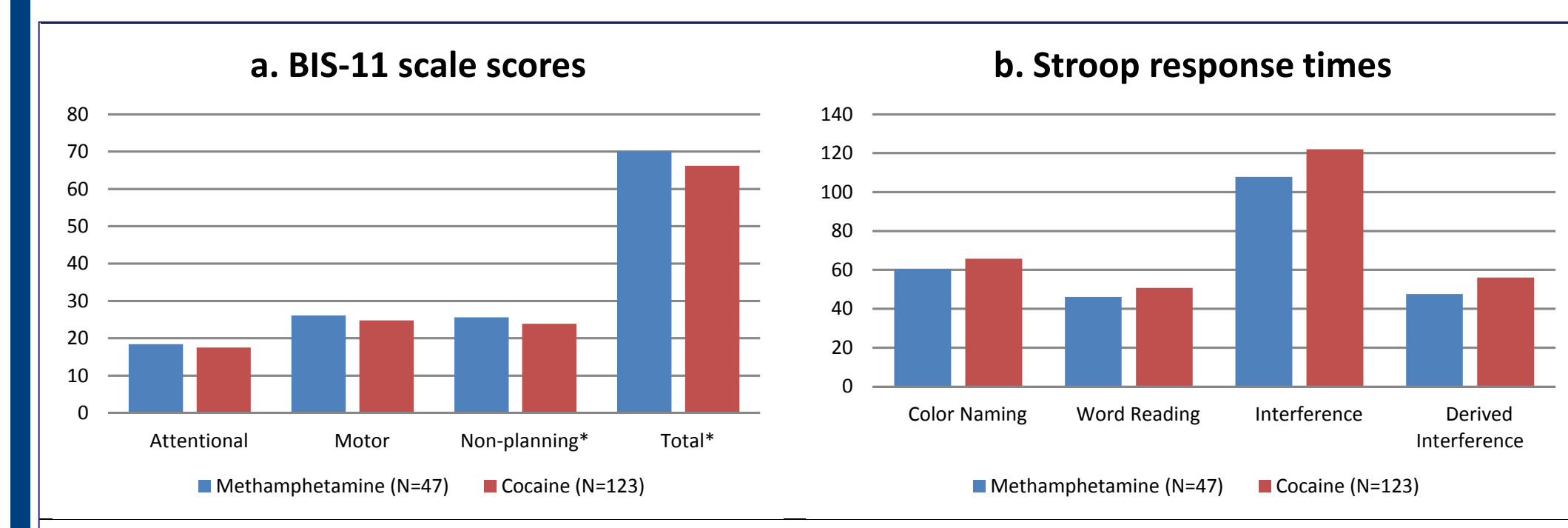
- Correlations between impulsivity and stimulant use during baseline, active treatment, and follow-up all less than $r=0.2$
- Methamphetamine-dependent patients had higher BIS-11 scores than cocaine-dependent patients for both Non-Planning Impulsiveness ($p<.05$; cohen's $d=0.37$) and Total ($p<.05$, $d=0.44$) scores while cocaine –dependent patients had a trend towards significantly longer Stroop interference ($p=0.058$) and derived interference ($p=0.061$) times. (Figure 1)

Table 1. Baseline sample characteristics as a function of stimulant-dependence diagnosis and treatment completion

	METH (N=47)	Cocaine (N=125)	Non-Completer (N=51)	Completer (N=132)
Age (years)	34.8 (8.4)	40.4 (9.1)**	36.9 (8.4)	39.3 (9.6)
Education (years)	11.7 (1.4)	12.1 (1.6)*	12.1 (1.4)	12.0 (1.7)
Male	17.0%	36.8%	31.4%	31.8%
Race				
White	87.3%	25.8%**	44.0%	43.2%
Black	2.1%	66.9%	42.0%	47.7%
Other / Mixed	10.6%	7.3%	14.0%	9.1%
Ethnicity-Hispanic	6.4%	2.4%	10.0%	3.8%
Court Mandate	29.8%	15.2%**	23.5%	16.7%
ADHD (%)	27.7%	36.0%	45.1%	30.3%
Stimulant Positive UDS	36.2%	16.1%**	35.3%	16%**
Stimulant use days, last 30	6.3 (8.0)	4.5 (5.6)	7.6 (8.0)	3.9 (5.1) **
Stimulant ROA:				
Smoking	54.4%	81.5%**	65.3%	75%
Oral/Nasal	6.5%	12.9%	16.3%	8.3%
IV	39.1%	5.6%	18.4%	16.7%
Stimulant Use (Years)	10.3 (6.8)	13.1 (7.6)*	11.4 (7.6)	12.5 (7.7)
Non-Stimulant Use (Years)	7.3 (6.7)	18.0(10.4)**	13.2 (10.3)	15.5 (10.6)
Non-Stimulant Diagnosis	48.9%	79.2%**	76.5%	69.7%
Mood/Anxiety Disorder	52.3%	37.6%	52.2%	36.5%
Dependence Diagnosis				
Methamphetamine	100%	0%	29.4%	24.4%*
Cocaine	0%	100%	58.8%	72.5%
Both	0%	0%	11.8%	3.1%

Note: Where not specifically indicated, values represent means (SD). METH=methamphetamine; ROA=Route of administration; * $p<.05$, ** $p<.01$

Figure 1. Relationship of BIS-11 and Stroop scores to stimulant-dependence diagnosis



- Non-completers, compared to completers, had higher BIS-11 Motor Impulsiveness ($p<.001$, $d=0.52$) scores and a trend toward higher total scores ($p=0.053$). (Table 2)

Table 2 Relationship of BIS-11 and Stroop scores to treatment completion

	Completers (N=130)	Non-Completers (N=51)	X ²
BIS-11:			
Attentional	17.6 (3.6)	18.0 (3.1)	0.65
Motor	24.6 (4.4)	26.8 (3.7)	10.28**
Non-planning	24.5 (4.7)	24.5 (4.5)	0.01
Total	66.7 (9.3)	69.4 (7.5)	3.74
Stroop:			
Color Naming	64.5 (12.9)	64.3 (12.7)	0.00
Word Reading	49.4 (10.5)	49.1 (9.3)	0.00
Interference	119.9 (27.5)	114.8 (27.0)	0.62
Derived Interference	55.4 (22.9)	50.5 (21.0)	1.66

Note: BIS-11=Barratt Impulsiveness Scale-11; Values are Means (SD); ** $p<0.01$

DISCUSSION

- Significantly greater BIS-11 scores in methamphetamine-, relative to cocaine-, dependent individuals consistent with research finding differential neurocognitive impairments in these patient populations¹¹; not consistent with a recent study that did not find significant BIS-11 differences between methamphetamine- and cocaine-dependent patients
- Consistent with past research, BIS-11 score was significantly associated with treatment completion
- Comalli-Kaplan Stroop performance was not associated with treatment completion which is not consistent with past research³; may be related to differences in study samples
- Consistent with past research, impulsivity was not predictive of stimulant use during treatment and follow-up; was also not significantly associated with baseline stimulant use amount

CONCLUSIONS

- The BIS-11 may be useful in identifying patients at risk for treatment non-completion
- Treatment-seeking methamphetamine- and cocaine-dependent patients may have different impulsivity profiles

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SUPPORT

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