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The predictive validity of SIS/SES and BIS/BAS scores for sexual and non-sexual risk behavior

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ABSTRACT

The theoretical proximity of the Dual-Control Model of the Sexual Response and the Reinforcement Sensitivity Theory predicts at least moderate-size correlations of measurements based on these models. However, sexual inhibition has also been claimed to be domain-specific, suggesting smaller-size correlations and superior prediction of sexual outcomes using measures of sexual inhibition and excitation, compared with generic measures. The aim of this study ($N = 254$) was to investigate the predictive validity of the Sexual Inhibition and Sexual Excitation Scale (SIS/SES) for, respectively, sexual and non-sexual risk behavior beyond prediction using scores on the Behavioral Inhibition and Behavioral Activation Scale (BIS/BAS). Both instruments, however, were found to contribute to the prediction of both types of risk behavior. The findings were interpreted as providing only partial support for the notion of domain specificity of sexual inhibition and excitation.

1. Introduction

The aim of this study was to investigate the predictive validity of the Sexual Inhibition and Sexual Excitation Scale (SIS/SES; Janssen, Vorst, Finn, & Bancroft, 2002a). Bancroft and Janssen (2000) postulated in their Dual-Control Model (DCM) that the interaction of the theoretical brain processes of sexual excitation and inhibition crucially impacts various aspects of sexuality, including sexual desire and arousal, sexual dysfunction, the effect of mood on sexual desire, and sexual risk-taking behavior. Sexual risk behaviors include early age of first intercourse, unwanted pregnancy, condomless sex in at-risk situations, and high number of casual sex partners. Individuals vary in their propensity for sexual excitation and inhibition. Sexual inhibition is assumed to be adaptive as it helps to refrain from engaging in sexual interactions that incur health risks. However, extreme inhibition proneness increases the vulnerability for sexual difficulties (Bancroft, Graham, Janssen, & Sanders, 2009).

The SIS/SES measures individual differences in sexual excitation and inhibition proneness (Janssen et al., 2002a). It comprises one excitation factor (SES), and two inhibitory factors: SIS1, sexual inhibition due to fear of low performance (e.g., erectile failure), and SIS2, sexual inhibition due to fear of negative consequences of sexual activity (e.g., STDs, pregnancy). The SIS/SES has adequate reliability and validity (Bancroft et al., 2009). The factor structure of the female version, modeled after the male version, was comparable to the male version's structure and had acceptable psychometric characteristics (Carpenter, Janssen, Graham, Vorst, & Wicherts, 2008). Empirical support has been found for the discriminative validity of the SIS/SES for erectile responses in male volunteers to safe and threatening stimuli (Janssen, Vorst, Finn, & Bancroft, 2002b), male sexual dysfunction (Bancroft, Carnes, Janssen, Goodrich, & Long, 2005), male sexual compulsiveness (Bancroft & Vukadinovic, 2004), and sexual risk behavior in both homosexual and heterosexual men (Bancroft et al., 2004).

The DCM can be viewed as a domain-specific version of Gray's Reinforcement Sensitivity Theory (RST, Gray, 1973; for reviews see: Corr, 2004; Corr & McNaughton, 2008). The original RST comprised a behavioral inhibition (BIS) and a behavioral activation system (BAS). The BIS governs behavior associated with stimuli predicting conditioned aversive events, loss of appetitive stimuli, extreme novel and intense stimuli, and with innately aversive and fear-evoking stimuli. The BAS mediates approach behavior related to both conditioned and innately present rewarding stimuli and termination of aversive events. More recently the role of the

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BIS in revisions of the RST was restricted to conditioned aversive stimuli, and still later to the resolution of goal conflicts (see Gray & McNaughton, 2000). A new element, the fight–flight–freeze system (FFFS) was added that mediates both innately present and unconditioned aversive responses, and freeze responses to unavoidable aversive events. More recently, the RST model with separate BIS-Fear and BIS-Anxiety factors has received empirical support (Corr & McNaughton, 2008; Dissabandara, Loxton, Dias, Daglish, & Stadlin, 2012).

Carver and White (1994) developed the BIS/BAS scale to assess individual differences in behavioral activation and inhibition proneness. Low BIS and high BAS are associated with psychotropic substance use (Johnson, Turner, & Iwata, 2003), while recreational drug use was found to be associated only with high BAS sensitivity (Zisserson & Palfai, 2007). Moreover, high BIS scores were found to be associated with anxiety symptoms (Segarra et al., 2007), and low BAS scores with depression (Pinto-Meza et al., 2006).

The theoretical proximity of the domain-specific DCM and the generic RST was already acknowledged in the first presentation of the DCM (Bancroft & Janssen, 2000). Investigation of the convergence of SIS/SES and BIS/BAS subscales using correlation analysis has thus far revealed small-size correlations, mostly in the expected direction (Graham, Sanders, & Milhausen, 2006; Janssen et al., 2002a), suggesting substantial disparity between RST and DCM.

The RST is presumed to govern behavior across widely varying domains, including social behavior and personality (Corr, 2004), in men and women alike (Jackson, 2003). However, sexual excitation and inhibition have been claimed to be domain-specific (Bjorklund & Kipp, 1996), referring to the parental investment theory (Trivers, 1972). Bjorklund and Kipp also argued, based on parental investment theory, that women may have experienced higher evolutionary pressure to inhibit their sexual arousal and impulsive sexual behavior, as this would incur higher costs for women than for men, suggesting gender effects on excitation and inhibition propensities.

With regard to the construct validity of the SIS/SES thus far only the concurrent validity between the SIS/SES and the BIS/BAS has been investigated, using correlation analysis. The aim of the present study is to further investigate the validity of the SIS/SES with respect to the possibility to predict behavioral outcomes in sexual domains, specifically by demonstrating an added value of the SIS/SES in predicting behavior in the sexual domain beyond the prediction by BIS/BAS scores alone. If both measures equally well predict sexual and non-sexual behavior, using only the generic BIS/BAS would be more parsimonious. From the presumed partial theoretical overlap of the generic RST and the domain-specific DCM we derive the central assumption in the present study, that SIS/SES scores will be superior to BIS/BAS scores when sexual outcomes are to be predicted, whereas the opposite result will be found when predicting non-sexual outcomes.

We hypothesize, specifically, that the proportion of explained variance will significantly increase when SIS/SES scores are added to the model after BIS/BAS scores are regressed on sexual risk behavior. In this study we will investigate condomless sex in at-risk situations, and high number of casual sex partners as sexual risk behaviors. In the same line of reasoning we hypothesize that adding SIS/SES scores to the regression of BIS/BAS scores on non-sexual risk behavior (abuse of alcohol and use of multiple recreational drug types) will not increase the proportion of explained variance. The suggested gender effect (Bjorklund & Kipp, 1996) on the association of sexual excitation and inhibition proneness and sexual risk behavior is investigated by adding gender as a mediator variable to the regression analysis. Furthermore, in line with previous findings, we predict small effect sizes ($.20 < r < .40$) of the correlations between corresponding SIS/SES and BIS/BAS subscales, and absence of significant correlations between non-corresponding subscales of these instruments.

2. Methods

2.1. Participants

Two hundred and fifty-four participants (178 women) were included (M_{age} = 25.3 years; SD = 9.6). Participants were recruited using student research participation websites and among workers in health care centers. Inclusion criterion was sufficient understanding of the Dutch language.

2.2. Materials

2.2.1. Behavioral Inhibition/Behavioral Activation Scale (BIS/BAS; Carver & White, 1994)

We used a Dutch translation of the original 20-item BIS/BAS, that has not yet been psychometrically investigated. For the present study, the 5-factor model was used with the following subscales: Behavioral Inhibition – Fear (BIS-F; range 3–12), Behavioral Inhibition – Anxiety (BIS-A; range 4–16), Behavioral Activation – Reward Responsiveness (BAS-RR: the positive reaction to reward or its anticipation; range 5–20), Drive (BAS-D: persistence in the pursuit of desired goals; range 4–16), and Fun-Seeking (BAS-FS: perceived value of new rewards and spontaneity in pursuing them; range 4–16). Subscales have acceptable internal consistency (Cronbach's α between .73 and .76), except for BAS-RR (α = .57), and convergent and discriminant validity (Carver & White, 1994). In the present sample the internal consistency was acceptable, with Cronbach's α ranging from .59 to .75. Higher scores represent higher activation or inhibition proneness.

2.2.2. Sexual Inhibition Scale – Sexual Excitation Scale (SIS/SES; Janssen et al., 2002a)

We used the Dutch translation of the original 40-items version (Janssen et al., 2002a) which has gender-neutral item wordings. We selected the three higher-order subscales: SES (range: 16–112), SIS1 (range: 12–84) and SIS2 (range: 12–84) that were shown to have acceptable internal consistency and adequate discriminant and convergent validity. In the present sample, the internal consistency was acceptable with SES Cronbach's α = .87, SIS1 α = .72, and SIS2 α = .75. Higher scores indicate higher excitation or inhibition proneness.

2.2.3. Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001)

The AUDIT is a 10-item self-report questionnaire (range: 0–40) to screen for excessive drinking. It has high internal consistency, with Cronbach's ranging from α = .80 to .86 (Fleming, Barry, & MacDonald, 1991), and test–retest reliability (r = 0.86; Babor et al., 2001). In the present sample, the internal consistency was acceptable (Cronbach's α = .80). The total AUDIT score was used as a continuous variable. Higher scores represent problematic alcohol use.

2.2.4. Recreational drug use

Recreational drug use in the past 3 months was assessed (yes/no), regarding the use of "party drugs" (Ecstasy, GHB, methylamine, hallucinogenics), opioids (heroin, methadone, and morphine), amphetamines or methamphetamines, cocaine, and cannabinoids. A dichotomous variable ("present" vs. "absent") was calculated for each drug type. A continuous sum score of the five dichotomous variables was computed to create a multiple recreational drug type use index.