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Do Gender and Directness of Trauma Exposure Moderate PTSD's Latent Structure?

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1.1 Introduction

In 2013, the American Psychiatric Association (APA) introduced the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; APA, 2013). While the diagnostic criteria for some disorders remained largely unchanged (e.g., depression), the posttraumatic stress disorder (PTSD) diagnosis underwent substantial revisions. PTSD was moved from the anxiety disorders category to a new ‘trauma and stress-related disorders’ category. The structure of PTSD was altered from a three-cluster model to a four-cluster model: (1) intrusions (B1-B5), (2) avoidance (C1-C2), (3) negative alterations in mood and cognition (NAMC; D1-D7), and (4) alterations in arousal and reactivity (AAR; E1-E6). Additionally, one symptom was revised [i.e., sense of a foreshortened future was changed to negative beliefs or expectations about oneself, others, or the world (D2)], and three symptoms were added [persistent and distorted blame of self or others (D3), persistent negative emotional state (D4), and reckless or destructive behavior (E2)].

Although a large body of psychometric research developed around the DSM-IV PTSD model (Yufik and Simms, 2010), the DSM-IV PTSD literature is less relevant given the substantial changes outlined above. Currently, the DSM-5 PTSD factor structure is being debated (cf. Armour, 2015). Indeed, three additional formulations of the DSM-5 PTSD criteria have been proposed: a six-factor anhedonia model (Liu et al., 2014), a six-factor externalizing behavior model (Tsai et al., 2015), and a seven-factor hybrid model (Armour et al., 2015b) (see Table 1).

All three alternative models retain the DSM-5 intrusion and avoidance clusters, and differ in their alterations of the NAMC and AAR clusters. The anhedonia model splits the NAMC cluster into negative affect (D1-D4) and anhedonia (D5-D7), and splits the AAR cluster into dysphoric arousal (E1-E2, E5-E6) and anxious arousal (E5-E6); this model was developed in a sample of Chinese earthquake survivors (*N* = 1196) (Liu et al., 2014). The theoretical rational of the anhedonia model was that general dysphoric arousal can be differentiated from fear-based anxious arousal, and has unique relations with psychophysiological, neural, and genetic markers (see Liu et al., 2014). The externalizing behavior model retains the NAMC cluster but splits the AAR cluster into externalizing behavior (E1-E2), anxious arousal (E3-E4), and dysphoric arousal (E5-E6); this model was developed in a nationally representative sample of U.S. veterans (*N* = 1,484) (Tsai et al., 2015). The externalizing model was developed because two AAR symptoms (E1, E2) represent an inability to regulate emotions and are conceptually distinct from the other hyperarousal symptoms. Both six-factor models provided better fit to the data than the four-factor DSM-5 model in their respective samples (Liu et al., 2014; Tsai et al., 2014).

In response to the superior performance of the six-factor alternative PTSD models, a seven-factor “hybrid” was proposed, composed of intrusion (B1-B5), avoidance (C1-C2), negative affect (D1-D4), anhedonia (D5-D7), externalizing behaviors (E1-E2), anxious arousal (E3-E4), and dysphoric arousal (E5-E6) symptom clusters (Armour, 2015; Armour et al., 2015a). The hybrid model was tested in three samples — U.S. veterans (*N* = 1,484; Armour et al., 2015), and two samples of U.S. university undergraduate students (*N* = 497, Armour et al., 2015; *N* = 412; Armour et al., 2015a), and compared against the DSM-5 model, the anhedonia model, and the externalizing behavior model. All models fit the samples well, but the hybrid model fit comparatively better than the other models.

In order to thoroughly evaluate model performance, potential moderators of PTSD factor structure (as measured by a particular instrument) need to be investigated. This process is called measurement invariance testing, and it establishes the stability of PTSD measurement between conceptually relevant groups (e.g., gender) (Elhai and Palmieri, 2011; Meredith and Teresi, 2006). Measurement invariance can influence estimates of PTSD prevalence, the pattern of symptoms cluster (e.g., factor model), the underlying meaning of PTSD cluster scores, and the meaning of individual items on a PTSD measure. If measurement invariance is *not* established, between-group differences in PTSD could be due to measurement differences and not true differences. A commonly used method for testing measurement invariance involves testing successively more restrictive assumptions of measurement equivalence between groups using a given model (Vandenberg and Lance, 2000). The first step usually involves testing if symptoms hang together in clusters equivalently between groups (*configural invariance*), then if symptom clusters mean the same between groups (*metric invariance*), and then if individual items (e.g., symptoms) mean the same between groups (*scalar invariance*). For example, differences in PTSD item severity could represent differences in the interpretation of items rather than true differences in symptom severity if scalar measurement invariance is not supported (Elhai and Palmieri, 2011). Additionally, measurement invariance needs to be tested for each model of PTSD because the configuration of symptom clusters affects the measurement of PTSD. This study will examine two potential moderators of PTSD's factor structure: gender and trauma directness, in four DSM-5 PTSD factor analytic models (DSM-5, anhedonia, externalizing behavior, and hybrid models). We will briefly review the literature on these potential moderators, and then describe the current study.

1.2 Gender as a moderating factor

Gender differences moderate the prevalence estimates and severity of PTSD (Tolin and Foa, 2006): women have an approximate twofold greater risk of PTSD than men even though men have a higher risk of potentially traumatic event (PTE) exposure. Additionally, women on average reported a higher conditional risk of PTSD after some PTEs: for example women reported PTSD more frequently after accidents and nonsexual assaults than men (Tolin and Foa, 2006). A recent study assessed the moderating effect of gender on DSM-5 PTSD models in a convenience sample of Australian adults (Carragher et al., 2015). Configural, metric, and scalar measurement invariance was supported for the DSM-5 model, the anhedonia model, and the hybrid model. Thus, gender did not moderate these models; the externalizing behavior model was not tested.

Findings on whether gender moderates DSM-IV PTSD factor structure have been mixed (Armour et al., 2011; Contractor et al., 2013; Hall et al., 2012; Wang et al., 2013). Three studies found that gender appeared to moderate individual item severity (*scalar noninvariance*), such that individual item intercepts did not reflect true differences in PTSD severity (Armour et al., 2011; Hall et al., 2012; Wang et al., 2013). In two studies girls had higher item-level intercepts (i.e., severity) than boys (Armour et al., 2011; Wang et al., 2013) and in one study men had higher item-level intercepts than women (Hall et al., 2012). In a fourth study, gender was not a robust moderator of factor structure (Contractor et al., 2013). The interpretation of these findings is limited because of significant measurement differences: DSM-5 diagnosis (Carragher et al., 2015) and DSM-IV diagnosis (Armour et al., 2011; Contractor et al., 2013; Hall et al., 2012; Wang et al., 2013); and sampling differences. Because only one study has examined measurement invariance using DSM-5 symptom criteria and prior research using DSM-IV symptom criteria has found mixed support for gender-related measurement invariance, the extent to which gender differences in DSM-5 PTSD are due to true difference in PTSD vs. measurement differences remains unknown.

1.3 PTE directness as a moderating factor

PTE directness—whether the PTE was directly- (e.g., sexual assault) or indirectly-experienced (e.g., unexpected bereavement)—may also moderate PTSD factor structure. Both direct and indirect PTEs can meet Criterion A (i.e., definition of a PTE). However, in response to criticism that *conceptual bracket creep* was diluting the definition of a PTE (Spitzer et al., 2007), the DSM-5 Criterion A was restricted so that unexpected bereavement must be due to violent or accidental causes. In a previous study of college undergraduates, unexpected bereavement accounted for 47% of all PTEs although the conditional probability of developing PTSD after unexpected bereavement was low (Frazier et al., 2009). Among trauma-exposed women, direct PTEs were significantly more likely results in PTSD than indirect PTEs (Anders et al., 2011). Only one study assessed whether PTE directness moderated PTSD factor structure (Contractor et al., 2014): PTE directness did not moderate DSM-IV PTSD factor structure in a sample of Indian children with direct and indirect exposure to the 2008 Mumbai terrorist attacks. Given the debate around what PTEs should meet Criterion A, we examined whether PTE directness moderated PTSD latent structure.

1.4 Current Study

The current study had two aims. First, we tested the viability of four different measurement models using one measure of PTSD (i.e., PTSD Checklist for DSM-5 [PCL-5]; (Blevins et al., 2015)). Second, we examined the potential moderating effects of subject gender and PTE directness on the adequacy of the fit of these models. Four different models of DSM-5 PTSD were tested: the DSM-5 model, the anhedonia model, the externalizing behaviors model, and the hybrid model. Based on previous literature (Carragher et al., 2015), we hypothesized that gender would not moderate the DSM-5 model, the anhedonia model, or the hybrid PTSD models. Although previous research has not tested the invariance of the externalizing behavior model, we hypothesized that gender would not moderate the externalizing behavior PTSD model given the finding of invariance across other DSM-5 PTSD models. Thus, we predicted configural, metric, and scalar invariance with regards to gender. We considered PTE directness analyses exploratory because of the dearth of previous literature.

2. Method

2.1 Participants

College students at a large public university (*N*= 911) completed a trauma history questionnaire and PTSD symptom checklist in an online study. Students were excluded if they did not complete the trauma history questionnaire (*n* = 24) or if they did not nominate a worst PTE (*n* = 422), which left a PTE exposed subsample of 465 participants. Students with PTE exposure were excluded if they were missing >30% of PCL items (*n* = 10). Thus, our effective sample was 455 participants. For the gender analyses, 47 participants were excluded because they did not indicate their gender. For the PTE directness analyses, 22 participants were excluded because their worst trauma could not be coded as direct or indirect. Recruitment occurred through a password-protected, closed website. Participants gave informed consent and the parent study received approval from the university's Institutional Review Board. The current study involved secondary data analyses of previously collected data (see Armour et al., 2015).

2.2. Measures

PTE was assessed using the *Stressful Life Events Screening Questionnaire* (SLESQ; Goodman et al., 1998). The 12-item self-report SLESQ asks about 11 Criterion A PTEs (e.g., "Have you ever had a life-threatening illness?") and one general PTE ("Have you ever been in any other situation where you were seriously injured or your life was in danger (e.g., involved in military combat or living in a war zone?") using a "yes" or "no" format. The "unexpected bereavement" item specified that death must have resulted from an accident or violence. Participants nominated their worst PTE, which was the reference event for the PCL-5. The SLESQ demonstrated two-week test-retest reliability ranging from 0.31 ("attempted sexual assault" to 1.00 (robbery/mugging) in a sample of college undergraduates (Goodman et al., 1998). PTEs were coded as direct or indirect by the first author. Eight events were coded as direct (i.e., life-threatening accident; physical force/weapon used during a robbery; physical force/threat used in sexual assault; physical force/threat used in attempted sexual assault; inappropriate sexual touching as a child; parent/caregiver physically harmed participant; partner/date physically harmed participant; threatened with a weapon) and three were coded as indirect (family member/close friend died; present when someone was killed, injured, or assaulted; repeated exposure to vivid trauma details). The general question was excluded because information to code PTEs as direct or indirect was not available.

PTSD symptoms were assessed using the 20-item self-report *PTSD Checklist for DSM-5* (PCL-5; Blevins et al., 2015). In the parent survey, items were rated on a 5-point scale, ranging from "not at all" (1) to "extremely" (5); however, scores were converted to a (0) to (4) scale to make comparisons with previous studies that use the PCL-5 easier. Thus, total score could range from 0 – 80. In the current study, internal consistency was Cronbach's $\alpha = .98$ The PCL-5 generally performs as well as the established DSM-IV PCL (Hoge et al., 2014).

2.3. Data Analysis

Confirmatory factor analysis (CFA) and measurement invariance testing were conducted using Mplus 7.3 software (Mplus, 2014). Models were estimated using maximum likelihood parameter estimation with robust standard errors. We assessed model fit using the comparative fit index (CFI), Tucker-Lewis index (TLI), and the root mean square error of approximation

(RMSEA). CFI and TLI ≥ .95 indicates good fit (acceptable fit = .90-.94), and RMSEA ≤ .06 indicates good fit (acceptable fit = .07-.08) (Hu and Bentler, 1999). Non-nested models were compared using the Bayesian Information Criterion (BIC), where 10-point lower BIC values indicate strong support for the model with lower values (Kass and Raftery, 1995). Measurement invariance testing was conducted using Mplus' CONFIGURAL METRIC SCALAR tests (Muthén, & Muthén, 2012).

We conducted measurement invariance testing using multiple-group CFAs to assess: (1) potential moderating effect of gender on PTSD factor structure, and (2) potential moderating effect of PTE directness on PTSD factor structure. To test measurement invariance, three successively more constrained models (Models A-C) of PTSD are compared to determine whether additional constraints worsen model fit (Meredith and Teresi, 2006). Model A tested configural invariance (i.e., whether items are related to the same factors) by allowing groups to vary on factor loadings, factor intercepts, and residual variances while holding factor means at zero. Configural invariance is considered the minimum standard of invariance that must be met; if configural invariance is not met, successively constrained models should not be tested (Meredith and Teresi, 2006). Model B tested metric invariance (i.e., whether factor loadings are equivalent) and constrained factor loadings as equal between groups. Model C tested scalar invariance (i.e., whether item intercepts are equivalent) and constrained observed variable intercepts to be equal across groups. The fit of successively more constrained models are compared against the less constrained models (e.g., comparing Model B against Model A, and Model C against Model B; Meredith and Teresi, 2006). The test of metric invariance (i.e., comparing Model B against Model A) tests whether constraining factor loadings as equivalent between groups significantly reduces fit. The test of scalar invariance (Model C against Model

B) tests whether constraining item intercepts as well as factor loadings as equivalent significantly reduces model fit. Although further constrained models tested (such as testing the invariance of residual error variances or covariances), these stringent invariance requirements are often violated in social science research and may be unreasonable for these psychological constructs (Millsap, 2011).

Measurement invariance was evaluated using chi-square difference tests and change in CFI values. Although researchers have traditionally used chi-square tests to evaluate the fit of successively constrained models, the chi-square statistics has been criticized as overly sensitive, particularly for larger samples (Cheung and Rensvold, 2002). Evaluating a change in goodness of fit indices, such as the CFI, was proposed as a more robust measure of measurement invariance. Therefore, we reported both the chi-square and change in CFI values. A nonsignificant chi-square test and a change in CFI less than or equal to .01 between unconstrained and constrained models indicates adequate model fit (Cheung and Rensvold, 2002). If these two statistics were inconsistent, we chose to interpret the change in the CFI. Because the subsamples were relatively small (e.g., males, n = 102), and all models had low overdetermination and item communalities, as indexed by r^2 ranging from .06 - .80, our sample may have been underpowered to reject the null hypotheses of measurement invariance (Meade and Bauer, 2007).

3. Results

Half of the participants who completed the trauma screening questionnaire nominated one event as their worst PTE (52.4%, n = 465). The effective sample (n = 455) was mostly female (67.3%, n = 306). Mean age was 20.07 (*SD* = 4.41; range =18-55). The PTE-exposed and non-PTE-exposed subsamples did not significantly differ in terms of gender or age. More students reported indirect PTEs (58.7%, $n = 267$) than direct PTEs (36.5%, $n = 166$). The most commonly-reported PTE was indirect: unexpected bereavement (49.2%, $n = 224$). The most commonly-reported direct PTE was attempted childhood sexual assault (8.8%, $n = 40$). Average PTSD severity ($M = 20.58$, $SD = 16.78$) score was below a clinical cut-off (cut-off = 38; National Center for PTSD, 2015). Nearly one fifth of the sample was at or above the clinical cutoff (17.8%, $n = 81$). The PCL-5 scores of women ($M = 21.52$, $SD = 16.34$) and men ($M = 17.40$, $SD = 17.48$) were significantly different, $t(406) = -2.17$, $p < .05$, Cohen's $d = .26$. PTSD severity was significantly higher after direct PTEs ($M = 22.77$, $SD = 16.96$) than after indirect PTEs ($M = 19.31$, $SD = 16.48$), $t\ (431) = 2.10$, $p < 05$, Cohen's $d = .21$.

First, we tested whether gender had a moderating effect on DSM-5, anhedonia, externalizing behavior, or hybrid PTSD models. The DSM-5 and externalizing behavior configural models fit poorly as evidenced by their low CFI and high RMSEA values (Table 2). Thus, the DSM-5 and externalizing behavior models did not display configural invariance and so more restrictive models (i.e., metric, scalar) were not tested. The anhedonia and hybrid configural models fit adequately and so demonstrated configural invariance. We next tested successively more constrained models (e.g., metric and scalar invariance) on the anhedonia and hybrid models. Both the anhedonia and hybrid models appeared to demonstrate metric invariance and scalar invariance (see Table 3). Thus, gender did not appear to have a moderating effect on factor configuration (i.e., configural invariance), factor loadings, (i.e., metric invariance), or individual item severity (i.e., scalar invariance) when using the anhedonia or hybrid models.

Second, we tested whether PTE directness moderated PTSD factor structure. The DSM-5 and externalizing behavior configural models displayed poor fit statistics, and thus were determined to exhibit configural noninvariance (see Table 2). Both the anhedonia and hybrid

PTSD configural models displayed adequate fit and further testing was conducted (see Table 3). Given the resulted in nonsignificant chi-square test and change in CFI less than .02 for Model B vs. A, metric invariance was supported. For both models, the comparison of Model C. vs Model B demonstrated an inconsistent result: the chi-square test was significant but the change in CFI was less than .02. On the balance, scalar invariance was supported. Thus, PTE directness did not appear to have a moderating effect on factor configuration, factor loadings, or individual item severity when using the anhedonia or hybrid models.

4.1 Discussion

Over half of the total sample (52.4%, *n* = 465) reported exposure to a PTE. The current sample has a relatively lower prevalence of PTE-exposure than in a previous large study of lifetime trauma prevalence in college students (85%, *n* = 1,347; Frazier et al., 2009). This discrepancy in PTE prevalence may be due to differences how PTEs were assessed: the current study assessed Criterion A events whereas Frazier et al., (2009) included a number of non-Criterion A events such as stalking (12%, *n* = 179) and uninvited/unwanted sexual attention (21%, *n* = 314) that increased PTE endorsement. Consistent with previous literature, in the current study women reported significantly more severe PTSD symptoms than men (Tolin & Foa, 2008) and participants with direct PTE exposure reported more severe PTSD symptoms and participants with indirect PTE exposure (Anders et al., 2011).

We hypothesized that gender would not moderate the DSM-5, anhedonia, externalizing behavior, or hybrid PTSD models. Our results provided mixed support for this hypotheses. In partial contrast to our hypotheses and to previous literature (Carragher et al., 2015), configural noninvariance was found for the DSM-5 and externalizing behavior models. Because configural measurement invariance was not supported, more stringent tests of measurement invariance (e.g., metric and scalar models) were not tested. Our findings may differ from Carragher et al., (2016) because of relevant measurement differences: the current study used a well-validated PTSD symptom checklist to assess PTSD symptom severity whereas the previous study used a researcher-created binary items (presence/absence) to assess each PTSD symptom. These findings suggest that the DSM-5 and externalizing behavior factor structures do not have consistent meaning between genders. Thus, for clinicians and researchers, these results imply that subgroups of university undergraduate men and women cannot necessarily be accurately compared with regards to DSM-5 PTSD symptom clusters or item-level severity. In addition, these findings cast doubt on the utility of using a PTSD cut-off score, given item-level severity differs between men and women.

In partial support of our hypothesis, configural, metric, and scalar invariance was found for the anhedonia and hybrid PTSD models. The anhedonia and hybrid models appear to be measured consistently between university undergraduate men and women. These results suggest that PTSD item-level severity can be accurately compared between men and women when using these alternative PTSD models. The results add to the accumulating body of knowledge from prior studies addressing gender-related differences in PTSD factor structure (e.g., Armour et al., 2011; Carragher et al., 2015; Contractor, et al., 2013; Hall, et al., 2012; Wang et al., 2013).

Results regarding the potential moderating effect of PTE directness was mixed. Configural noninvariance was found for the DSM-5 and externalizing behavior models. These findings suggest that, when using the DSM-5 or externalizing behavior models, individuals with PTSD symptoms associated with direct PTE-exposure cannot be accurately compared to individuals with PTSD associated with indirect PTE-exposure: the PTSD construct may have a different meaning contingent on whether the PTE was direct or indirect. Given the prevalence of unexpected bereavement, this phenomenon and its association with PTSD symptoms need further investigation. We speculate that clinical differences between PTSD stemming from direct PTEs (such as sexual assault) and indirect PTEs (such as unexpected bereavement) may bear most strongly on the AAR symptom cluster. For example, learning about the violent death of a loved one may be disturbing but may not be experientially charged enough to create a network of PTE-associated memories that evoke fear and threat-based reactions (such as hypervigilance).

Results tie into the ongoing debate on the utility and definition of PTSD's Criterion A (Weathers and Keane, 2007). DSM-5's Criterion A revisions were an attempt to clarify and restrict the indirect events that qualify as a PTE (APA, 2013). Our results suggest that statistical differences between directly- and indirectly-exposed individuals are not due to true differences in PTSD severity. This has critical implications when assessing PTSD symptoms as well as interpreting findings of research studies that have compared such within- and between-group differences (Anders et al., 2011; Contractor et al., 2013). For the anhedonia and hybrid models, configural, metric, and scalar invariance was found. Thus, PTE directness did not appear to have a moderating effect on the anhedonia or hybrid PTSD models.

4.2 Limitation and Future Directions.

The current study had a few limitations. First, generalizability is limited to undergraduate populations. Second, the data were self-reported. Third, all of the PTSD models examined in the current study include factors that are measured by only two items.

Future research is needed to expand knowledge about the factor structure of DSM-5 and alternative PTSD models. PTSD's factor structure needs to be evaluated in diverse and representative samples, such as community and clinical samples. Future studies ought to evaluate additional moderators of PTSD, such as single trauma (e.g., isolated sexual assault) versus chronic trauma (e.g., childhood abuse) that are proposed to underlie differences in simple and complex PTSD (Cloitre et al., 2013). Preliminary research has established differential associations between PTSD symptom clusters and depression, suicide, and hostility using the 7-factor hybrid model (Armour et al., in press; Pietrzak et al., 2015). Additional research along these lines is needed to understand how PTSD relates to important associated outcomes. The current study, and future studies that extend this research, are needed to refine our understanding of how psychiatric diagnoses are measured. Clinicians and researchers need effective and accurate assessment tools to make appropriate diagnoses and treatment recommendations.

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Table 1

Symptom Mappings for PTSD Models

Symptom	DSM-5	Anhedonia	Externalizing Behaviors	Hybrid
B1: Recurrent thoughts of trauma	In	In	In	In
B2: Recurrent dreams of trauma	In	In	In	In
B3: Flashbacks	In	In	In	In
B4: Psychological cue reactivity	In	In	In	In
B5: Physiological cue reactivity	In	In	In	In
C1: Avoidance of thoughts of trauma	Av	Av	Av	Av
C2: Avoidance of reminders of trauma	Av	Av	Av	Av
D1: Memory impairment	NACM	NACM	NACM	NA
D2: Negative beliefs	NACM	NACM	NACM	NA
D3: Distorted blame	NACM	NACM	NACM	NA
D4: Persistent negative emotional state	NACM	NACM	NACM	NA
D5: Diminished interest in activities	NACM	An	NACM	An
D6: Feelings of detachment from others	NACM	An	NACM	An
D7: Inability to experience positive emotions	NACM	An	NACM	An
E1: Irritability or anger	AAR	DA	EB	EB
E2: Reckless or self-destructive behaviour	AAR	DA	EB	EB
E3: Hypervigilance	AAR	AA	AA	AA
E4: Exaggerated startle response	AAR	AA	AA	AA
E5: Difficulty concentrating	AAR	DA	DA	DA
E6: Sleeping difficulties	AAR	DA	DA	DA

Note: In, Intrusive memories; Av, avoidance; NACM, negative alterations in cognitions and mood; AAR, alternations in arousal and reactivity; NA, negative affect; An, anhedonia; DA, dysphoric arousal; AA, anxious arousal; EB, externalizing behaviors.

The symptom configurations of the four DSM-5 PTSD factor models tested in the current study: DSM-5 model (APA, 2013); anhedonia model (Liu et al., 2014); externalizing behavior model (Tsai et al., 2015); and hybrid model (Armour et al., 2015b). These models differ primarily in the way that Criterion D and Criterion E symptoms are configured.

Table 2

Fit Statistics of Multiple-group CFAs Comparing Gender and PTE Proximity

Models Tested	χ^2	*df*	CFI	TLI	RMSEA, 90% CI	BIC
Gender Comparison						
DSM-5	921.35	328	.84	.81	.09, .09-.10	23402.81
Anhedonia	644.62	310	.91	.89	.07, .07-.08	23150.03
Externalizing Behavior	799.47	310	.87	.84	.09, .08-.10	23332.60
Hybrid	593.95	298	.92	.90	.07, .06-.08	23149.28
Proximity Comparison						
DSM-5	849.31	328	.87	.84	.09, .08-.09	23124.82
Anhedonia	580.63	310	.93	.91	.06, .06-.07	22863.39
Externalizing Behavior	727.90	310	.89	.87	.08, .07-.09	23059.35
Hybrid	523.36	298	.94	.93	.06, .05-.07	22854.21

Note: CFI, Comparative fit index; TLI, Tucker-Lewis index; RMSEA, root mean square error of approximation; 90% CI, 90% confidence interval; BIC, Bayesian information criterion. Gender comparisons, $N = 408$ (male, $n = 102$; female, $n = 306$); Proximity comparisons, $N = 400$ (direct, $n = 166$; indirect, $n = 264$); All χ^2 tests were significant at $p < .001$.

Table 3

Measurement Invariance Test Results

Gender			χ^2(df)	*p*-value	Δ CFI
	Anhedonia				
		B vs A	13.00 (14)	.53, *n.s.*	.00
		C vs B	22.66 (14)	.07, *n.s.*	.00
	Hybrid				
		B vs A	9.71 (13)	.72, *n.s.*	.00
		C vs B	21.63 (13)	.06, *n.s.*	.00
Proximity					
	Anhedonia				
		B vs A	13.19 (14)	.51, *n.s.*	.00
		C vs B	27.68 (14)	*	.00
	Hybrid				
		B vs A	15.70 (13)	.27, *n.s.*	.00
		C vs B	27.91 (13)	**	.00

Note: χ^2 statistic is difference between chi-square values for model comparisons; df = degrees of freedom; Δ CFI = change in Comparative Fit Index between models, values > .01 indicate noninvariances; Model A is the configural model. Model B is the metric model. Model C is the scalar model.

* $p < .05$, ** $p < .01$