

A Structural Equation Model Measuring Faking Propensity and Faking Ability

J. Michael Clark III

Michael D. Biderman

University of Tennessee at Chattanooga

Authors' Note: Correspondence regarding this article should be sent to Michael Biderman, Department of Psychology / 2803, U.T. Chattanooga, 615 McCallie Ave., Chattanooga, TN 37403. Tel.: (423) 425-4268. Email: Michael-Biderman@utc.edu

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TITLE

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ABSTRACT

Measures of several personality variables were obtained in a repeated measures design employing honest, incentive, and instructed-faking conditions. Application of a structural equation model found faking propensity and faking ability latent variables to be uncorrelated. Faking propensity was related to emotional stability. Faking ability was related to cognitive ability.

PRESS PARAGRAPH

The impact of faking on the validity of noncognitive tests, such as personality inventories, used for selection of employees is a controversial topic. Studies have reached conflicting conclusions, but differences in results may reflect differences in the nature of faking studies. This study estimated both faking propensity and faking ability of the same persons. It was found that propensity is unrelated to ability. Faking propensity was related to emotional stability and faking ability was related to cognitive ability. Neither was related to the other personality characteristics included in the study.

The use of noncognitive tests for selection has steadily increased for the past 15 years (e.g., Mueller-Hanson, Heggstad, & Thornton, 2003). These tests have demonstrated incremental validity over cognitive ability tests, the current gold standard for selection in a wide variety of jobs (Schmidt & Hunter, 1998). The fact that noncognitive tests also have less adverse impact than cognitive ability tests has also been an important reason for their use (Outtz, 2002).

It has long been recognized that noncognitive tests are vulnerable to response distortion or faking (Hough, Eaton, Dunnette, Kamp, & McCloy, 1990). Some studies have found little or no effect of faking on the predictive validity of such tests (e.g., Barrick and Mount, 1996), while others have found evidence that the presence of faking decreases test validity (e.g., Mueller-Hanson, Heggstad, & Thornton, 2003; Peeters & Lievens, 2005). Although the issue of the full impact of faking on validity of noncognitive tests clearly is not settled, it seems that there is enough evidence that faking may affect the validity and therefore the potential usefulness of noncognitive tests to warrant continued investigation into the issue of faking of such tests.

Some of the contradictory findings may stem from different ways in which faking has been operationalized. Faking behavior seems to involve at least two characteristics. The first is *propensity*, or motivation to fake - a person's likelihood of distorting his/her responses in the absence of instructions to engage in such distortion. The second characteristic is *ability* to fake - the degree to which a person can distort his or her responses to a noncognitive measure, particularly when instructed to do so. It may be that the two characteristics operate to different degrees in different testing situations.

Some studies, especially those involving the manipulation of incentives, probably assess mainly faking propensity (e.g., Schmit & Ryan, 1993). Others, for example those utilizing instructions to fake (e.g., McFarland & Ryan, 2000), probably involve little variation in propensity. Such differences between studies may account for some of the conflicting conclusions.

Although there has been some recognition of the potential difference between propensity to fake and ability to fake, there appears to have been no research attempting to isolate the two constructs and study the relationship between them. This study investigated the relationship between the two using a repeated measures design involving an honest instructional condition, an incentive condition, and an instructed faking condition.

The data consisted of a cognitive ability test administered at the beginning of the study and several noncognitive measures administered in each of the instructional conditions. These included a Big Five measure using the Goldberg IPIP item bank (Goldberg, Johnson, Eber, Hogen, Ashton, Clonginger, & Gough, 2006) and Paulhus's social desirability scale, the Balanced Inventory of Desirable Responses (BIDR) (Paulhus, 1991). The BIDR measures self-deceptive enhancement, representing a trait that is stable and relatively immutable to conscious manipulation, and impression management, a form of social desirability that is associated with intentional self distortion (Paulhus, 1991). Finally, a scale was created to mimic "bogus item" scales that have been used in the past (Anderson, Warner, & Spencer, 1984; Pannone, 1984). This scale consisted of names of tools, office products, and software packages used in an office setting. Many of these items were real (Excel, Printer, Fax machine, etc.), but others were not (DocuStoreIt, Reciprocal Client Locator). Participants were asked to rate their familiarity with each item.

A structural equation model based on one proposed by Biderman and Nguyen (2004) was applied to the data (see also Wrensen & Biderman, 2005). The measurement model is represented in Figure 1. The model was applied to the observed scores from the three conditions

– honest, incentive, and instructed-faking. On the right are latent variables representing the characteristics directly indicated by the observed variables – the Big Five dimensions – extroversion, agreeableness, conscientiousness, stability and openness, tendency for self-deception, tendency for impression management, and product familiarity.

Faking is represented in the model by latent variables with indicators from the conditions in which participants were given incentives to or instructions to fake. There are two faking latent variables: FP representing faking propensity and FA representing faking ability.

Means and intercepts of the variables were estimated in the present model. Thus, the model represented in Figure 1 can be conceptualized as a variant of a longitudinal growth model (LGM) (Chan, 1998; Duncan, Duncan, Strycker, Li, & Alpert, 1999) involving multiple constructs. The honest instructional condition can be thought of as a “Time 0” condition, with the two faking conditions as two other points in time. The latent variables on the right in Figure 1 are analogous to the intercept latent variable in a LGM although the loadings of indicators on these variables were not set to one as is commonly done in applications of longitudinal models. The faking latent variables are analogous to LGM slope latent variables. Many presentations of LGMs assume a linear change across time intervals estimating only one slope latent variable. But other presentations have considered multiple change latent variables such as the two presented here (e.g., Duncan et. al., 1999).

Although this study was primarily an exploratory one, some expectations involving logical considerations and past research were considered. A logical hypothesis entertained in the study was that in the incentive condition, behavior would be determined by both the participant’s propensity to fake and also by the ability to fake. This hypothesis is represented by the model presented in Figure 2, in which observed variables in the incentive condition load on both the faking propensity and the faking ability latent variable while those in the instructed faking condition load only on the faking ability latent variable.

Based on prior applications of a similar model of faking ability by Biderman and Nguyen (2004) and Wrensen & Biderman (2005) it was expected that cognitive ability would be positively related to the faking ability latent variable, although there was no empirical reason to expect cognitive ability to be related to faking propensity. Based on a study by McFarland and Ryan (2000), the relationships of faking ability to the Big Five traits of conscientiousness and emotional stability were examined.

It was expected that individual differences in the faking propensity latent variable would be related to self deception. Based on Paulhus’s (1991) conceptualization of the difference between self deception and impression management, it was expected that faking ability latent variable would be related to impression management and there would be negligible loadings of the self deception scales onto the faking ability latent variable.

Method

Participants

One hundred seventy-one undergraduate students from a public southeastern university participated. Three were removed from the dataset due to test contamination issues.

Measures

All noncognitive tests were divided into three forms. Items from each test bank were randomly assigned into one of the three forms without replacement. All possible orders of forms across participants within the honest, incentive and instructed-faking conditions were employed. Approximately equal numbers of participants received each order.

Wonderlic Personnel Test. All participants took Form A of the Wonderlic personnel test.

Goldberg's Big Five Personality Inventory (Goldberg, et. al., 2006). Ninety items from Goldberg's online inventory of items were randomly assigned to the three forms so that each form consisted of 30 items with six for each of the five personality factors.

To combat the potential problem of ceiling effects in faking conditions, the original five point scale was expanded to seven points, and some of the items were slightly reworded. Some positively-worded items were reworded to sound more extreme, while some reverse-scored items were reworded to be more moderate. Only adjectives such as, "always," "never," and "sometimes" were added to the statements.

Balanced Inventory of Desirable Responses (BIDR: Paulhus, 1991). The 40 item BIDR scale was broken down into three forms of 13 items each, each form yielding a self deception and impression management score. Scores on all the scales were computed as means of responses to prevent the differences in number of items from influencing estimates of condition means.

Product Familiarity Inventory. Three equivalent forms were created from a pool of real and bogus items. Each of the three forms of the product familiarity inventory contained 19 total items, of which 5 were bogus.

Procedure

All participants received the conditions in the same order – honest, incentive, and instructed faking. The same order of conditions was used because of the high likelihood of asymmetric carry-over effects from both the incentive and the instructed faking conditions.

Participants took form A of the Wonderlic Personnel Test, followed by the honest instruction condition in which participants were instructed to read each item on the three tests (personality, BIDR, product familiarity inventory) carefully and to respond honestly. Participants were given no incentive or instruction to fake in this condition. Next, in the incentive condition, participants were informed of a prize drawing tied to performance in this section. Participants were told the top 20 applicants for a customer service job would be entered into a prize drawing to receive one of four \$50 gift cards. After being told of the incentive, they were reminded to respond honestly. Finally, in the instructed faking condition, participants were instructed to respond to the three tests in a manner that would make them appear to be an ideal but believable candidate for employment. At the end of the project, all participants were entered into the prize drawing. Performance had no bearing on the disbursement of the gift cards.

Model

In an effort to reduce error variance due to differences in form means within each condition, a form-specific constant was added to each score within each condition so that the means of forms of the same measure within the condition were equal. These adjustments did not affect means between conditions.¹ Means of the Big 5, self deception, impression management, and personal familiarity latent variables were set equal to zero to insure identifiability and because there was no interest in differences in them. Means of the two faking latent variables, FP and FA were estimated. Intercepts of corresponding observed variables, (e.g. extroversion in the honest condition, in the incentive condition, and in the instructed-faking condition)_ were set equal and a common value was estimated. The model was applied using AMOS Version 5 (Arbuckle & Wothke, 1999).

Results

Responses to the bogus items formed an L-shaped distribution. For this reason, the bogus items were dropped and a scale representing familiarity with only actual items was used as the

product familiarity measure. Table 1 presents means, standard deviations, reliabilities, and correlations between scales across forms.

The first model applied is represented in Figure 1. In this measurement model it is assumed there are two potentially correlated faking latent variables: FP representing faking in the incentive condition and FA representing faking behavior in the instructed faking condition. Figure 3 presents the standardized solution. The chi-square statistic was 275.84 with $df=221$ ($p < .01$). The CFI measure of fit was .961 and the RMSEA was .038 (90% CI = .021, .052), each within an acceptable range (e.g., Raykov & Marcoulides, 2000, p. 40-41). Completely standardized loadings of observed variables on their respective construct latent variables ranged from .24 to .87 ($p < .01$ for all). Completely standardized loadings of the incentive condition observed variables onto the FP latent variable ranged from .11 to .45 ($p < .05$ for all). Those of the instructed faking condition observed variables onto the FA latent variable ranged from .44 to .74 ($p < .001$ for all).² Variances of all construct latent variables were significantly different from zero ($p < .001$ for all).

Means of both the FP and FA latent variables were larger than zero ($p < .001$) as were variances of FP ($p < .05$) and FA ($p < .001$). Effect sizes for the FP and FA latent variables, computed by dividing the estimated mean of each by its estimated standard deviation, were 1.02 and 2.04, respectively. The correlation between the FP and FA latent variables was .10 ($p > .05$).

Model 2 was applied to test the notion that faking in the incentive condition would be a function of both propensity and ability. Figure 4 presents the standardized results for this model. Examination of the loadings of the incentive variables onto FA suggests that this model does not characterize the data appropriately. All the loadings of incentive condition variables onto FA were small and three were negative. This pattern suggests the incentive condition variables are not related to faking ability as represented by Model 2. Since this model is a generalization of Model 1, the significance of the increase in fit was tested using the chi-square likelihood ratio test. The chi-square statistic was 10.72 with $df=8$ ($p > .05$), indicating that Model 2 did not fit the data significantly better than Model 1.

To investigate the implications of past research findings for the present data, a structural model was applied in which the multivariate relationships of FP and FA to cognitive ability, conscientiousness, stability, self deception, and impression management were examined. The results of this Model 3 are presented in Figure 5. In it, both FP and FA were regressed onto the Wonderlic observed variable and the S, C, SD, and IM latent variables. Because each regression was simultaneous, each regression weight assessed the unique variation in FA or FP associated with the predictor. Chi-square for this structural model was 279.83 with $df=228$ ($p < .05$). CFI was .963 and RMSEA was .037. Since this model includes the Wonderlic, goodness-of-fit statistics from it are not directly comparable to those of Model 1.

The regression weights from Model 3 that represent the structural relationships tested above are presented in Table 2. Cognitive ability was related to FA ($p < .05$, one-tailed), replicating Biderman and Nguyen (2004) and Wrensen and Biderman (2005). Cognitive ability was not related to FP. Neither faking latent variable was related to conscientiousness. The estimated relationships of both faking latent variables to Stability were negative although only the relationship of FP to S was significant ($p < .05$). There was a suggestion that FP was related to self-deception ($p < .10$).

Discussion

The study reported here is the first attempt to estimate both the propensity and ability to fake noncognitive measures using a structural equation modeling approach. In each of the faking

conditions a latent faking parameter appeared to capture faking behavior in that condition. This replicates and extends the results of Biderman and Nguyen (2004) who found that a single faking ability latent variable captured instructed faking across the Big 5 dimensions and a situational judgment test. It reinforces the conjecture of McFarland and Ryan (2000) who suggested individual differences in faking are fairly consistent and not test-specific.

This study confirms the previous findings that noncognitive measures can be faked when participants are instructed to do so and will be faked when participants are provided incentives to do so. Faking of the Big 5 measures has been found in previous studies using both the Goldberg IPIP items and the NEO items (e.g., Biderman and Nguyen, 2004; Raymark, Shilobod, & Steffensmeier, 2004; Nguyen, Biderman, & McDaniel, 2005). The faking of the IM scales, as indicated by positive loadings on both the FP and FA latent variables was expected. However, the positive loadings of the self deception (SD) scale onto the FA latent variables were not expected. In fact, the standardized loadings of the SD variables were nearly as large as the standardized loadings of the IM variables. The product familiarity measure, original to this study, was neither more nor less immune to faking than the other measures.

The differences between the incentive- and instructed-faking conditions suggest that faking does depend on the situation in which it occurs. The evidence provided here of the need for two faking latent variables reinforces the commonsense notion that the propensity to fake is separate from the ability to fake. The near zero correlation between the two latent variables gives the puzzling suggestion that the propensity to fake in an incentive condition is essentially independent of the ability to fake when so instructed. If supported by future research, this finding certainly suggests that in faking research some attention must be paid to which type of faking is being measured or manipulated – to the conditions under which faking occurs.

The model presented here, and, in fact, any analysis that defines faking in terms of comparison of mean performance in an honest condition with performance in a faking condition conceptualizes faking as a change in central tendency. Even studies in which faking has been defined in terms of scores on social desirability indices treated faking as a level shift in scores on a social desirability instrument. Evidence for such level shifts is abundant in previous studies and is also evident here. So there is little doubt that faking in both conditions of the present study involved a shift in level, an adjustment of responses in whichever direction was appropriate.

In spite of the considerable evidence that faking involves a shift in central tendency, post hoc examination of individual participant response sheets suggested that some participants may have also employed another strategy in the faking conditions. Some of the participant response sheets contained large numbers of identical responses, some at the extremes of the response scale (e.g., 1 or 7 for the Big 5 items, 1 or 5 for the other scales) but some at responses close to the extreme, for example 2 and 6 for the Big 5 items. These response patterns suggest that some participants employed a “targeting” response strategy in the faking conditions, picking specific responses and always giving those responses. This targeting behavior was most prevalent in the instructed faking condition and occurred very little in the incentive condition.

The existence of a strategy involving targeting could explain the independence of the two latent variables. It is possible that most participants employed a strategy involving a shift in level from the honest condition level in the incentive condition, while many used a targeting strategy in the instructed faking condition. The latent variables in the model captured only the level shift associated with each strategy. If the tendencies to use the two strategies were

relatively independent of each other, it would be expected that the latent variables capturing the level shifts resulting from the two strategies would be independent also.

If faking strategies involve targeting of specific responses or response categories to any great extent, this will require a reconceptualization of explicit models such as those presented here and also of implicit models based on the use of difference scores or social desirability scales.

The data here replicated previous findings that faking ability—as defined by the FA latent variable—was positively related to cognitive ability. The lack of a relationship between FP and the Wonderlic agrees with a commonsense notion that faking propensity is a characteristic independent of cognitive ability, while faking ability is just that—an ability—and probably would be related to cognitive ability. The indication that some participants targeted specific responses in the instructed faking condition suggests the behavior in that condition might be best conceptualized as problem-solving rather than faking behavior. Conscientiousness was not related to either faking characteristic, a finding in line with those of Biderman and Nguyen (2004) and Wrensen and Biderman (2005) although not in line with the finding of McFarland and Ryan (2000) who utilized an instructed faking condition and found that differences scores from the other Big 5 dimensions were related to conscientiousness.

Emotional stability was negatively related to faking propensity in this study although not related to faking ability. In contrast, McFarland and Ryan (2000) found a relationship of stability to faking ability defined using difference scores in an instructed faking paradigm. The analyses conducted here were multivariate analyses controlling for other variables while those of McFarland and Ryan (2000) were univariate. It is possible that differences in control of other variables contributed to the difference in results.

The BIDR was intended to assess self deceptive enhancement and impression management. The fakability of the SD scale suggests that this characteristic may not be as immune from applicant manipulation as originally proposed (Paulhus, 1991). However, Paulhus (2002) has recently suggested that the that the SD measures may be no more unconscious than and thus just as fakeable as, the IM measures. The present study has found evidence that both of these constructs indicated by the BIDR are fakeable.

Limitations and suggestions for future research.

The present research used the same order of conditions for all participants, limiting interpretation of the faking effect size differences between the incentive and instructed faking conditions. An alternative design, with two groups of participants, one receiving the honest followed by the incentive condition and the other receiving honest followed by instructed faking would allow estimation of faking effect sizes unconfounded by order.

The conceptualization of faking as an unconstrained level shift from an “honest” baseline may limit its generalizability. Implicit in such a definition is the assumption that the ideal amount of response distortion is the greatest amount possible. For example, under this conceptualization those whose responses in the instructed faking condition were most different from their responses in the honest condition would be considered to be the “best” fakers (i.e., those with the most faking ability or faking propensity). This assumption, however, does not take into consideration ideal levels for the various personality dimensions. For example, some people may have faked so much in the instructed condition that their responses would have been considered unbelievable in a real-world selection situation. In future research, assessment of faking ability and propensity may require models in which proximity to an ideal, believable level of responding is taken into account.

To limit the targeting of responses that may have complicated the application of the model to the instructed faking condition, instruments with more complex response formats should be investigated. The increase in use of situational judgment tests and recent evidence that they, too are fokable (Nguyen, Biderman, & McDaniel, in press), suggests the type of investigation represented by this study should be extended beyond personality tests to SJTs and other forms of noncognitive tests.

Conclusion. The study presented here indicates certain aspects of behavior in faking paradigms can be successfully captured using SEM techniques. At the same time, it suggests the behavior of persons in such paradigms may be more complex than has previously been assumed.

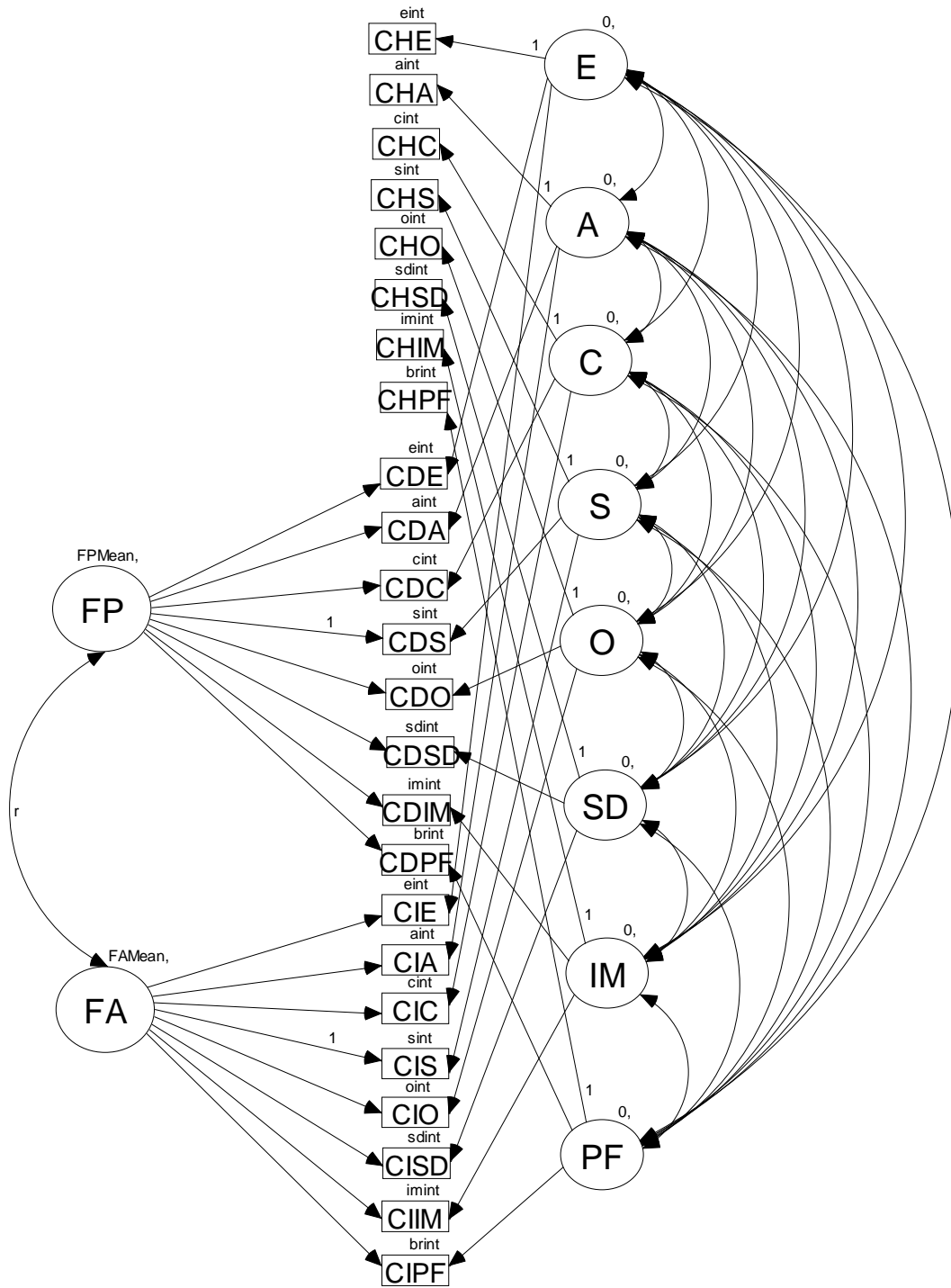


Figure 1. Model 1. Measurement model in which Incentive condition indicators (CDE to CDPF - D for Dollar) load on the latent variable representing Faking Propensity (FP) and instructed faking condition indicators (CIE to CIPF) load on the latent variable representing Faking Ability (FA). Residual latent variables have been omitted from the diagram. Personality dimension latent variables are Extroversion (E), Agreeableness (A), Conscientiousness (C), Stability (S), Openness (O), Self Deception (SD), Impression Management (IM) and Product Familiarity (PF).

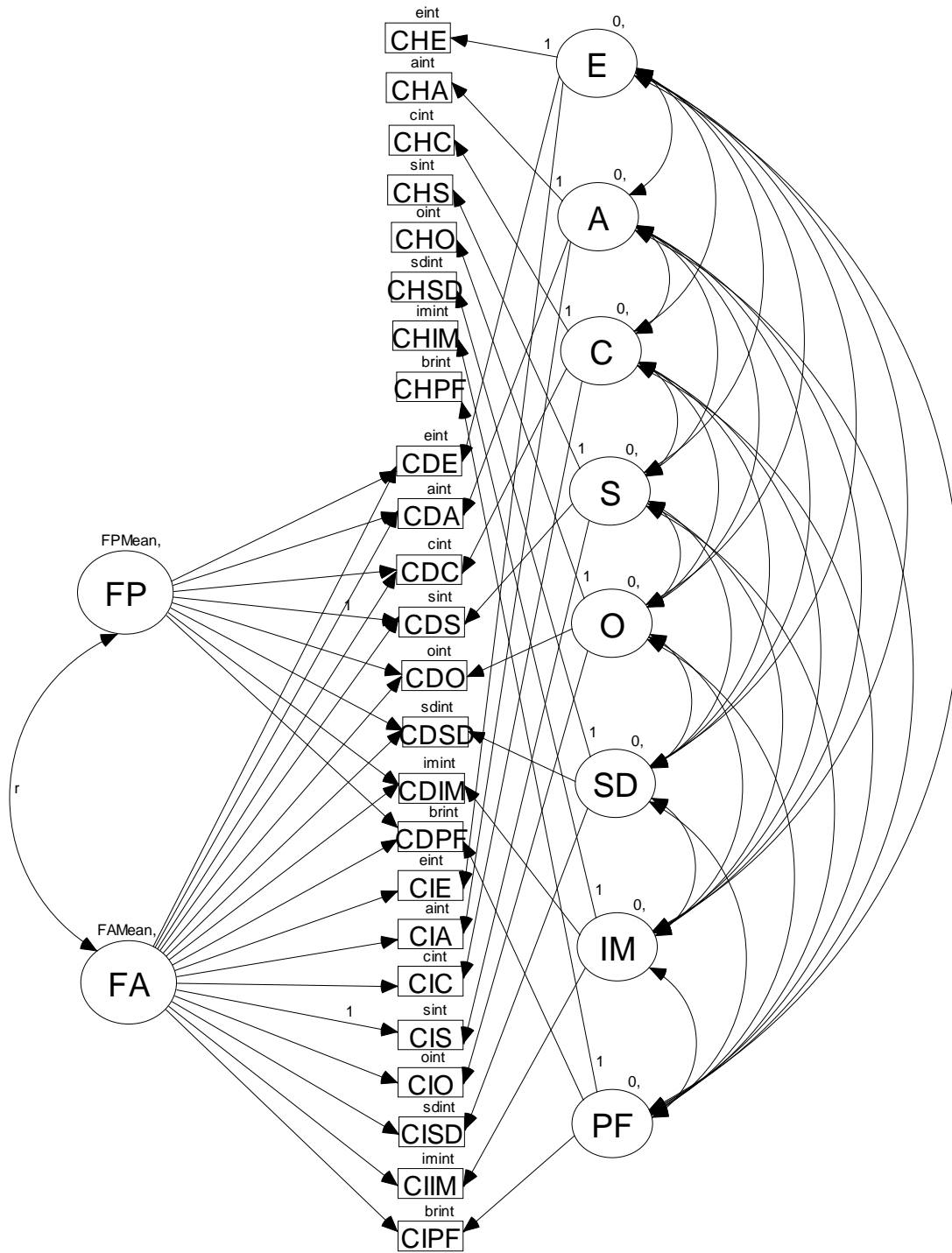


Figure 2. Model 2. Measurement model in which Incentive condition indicators (CDE to CDPF) load on the latent variable representing Faking Propensity (FP) and both incentive condition and instructed faking condition indicators (CDE to CDPF and CIE to CIPF) load on the latent variable representing Faking Ability (FA). Residual latent variables have been omitted from the diagram.

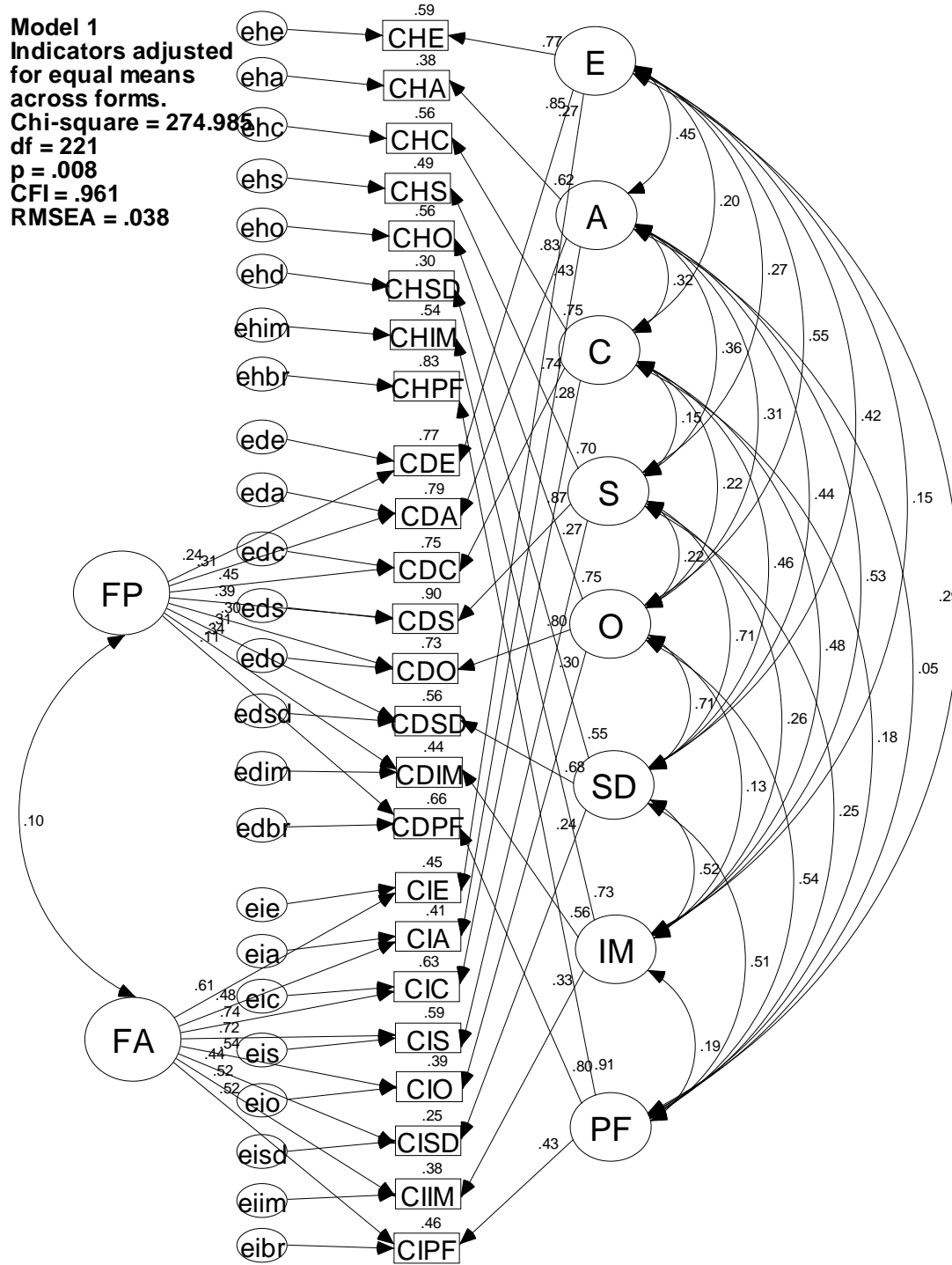


Figure 3. Model 1 completely standardized estimates. Values above indicator symbols are estimates of proportion of variance in the indicator related to latent variables.

Model 2
Indicators adjusted
for equal means
across forms.
Chi-square = 265.128
df = 214
p = .010
CFI = .963
RMSEA = .038

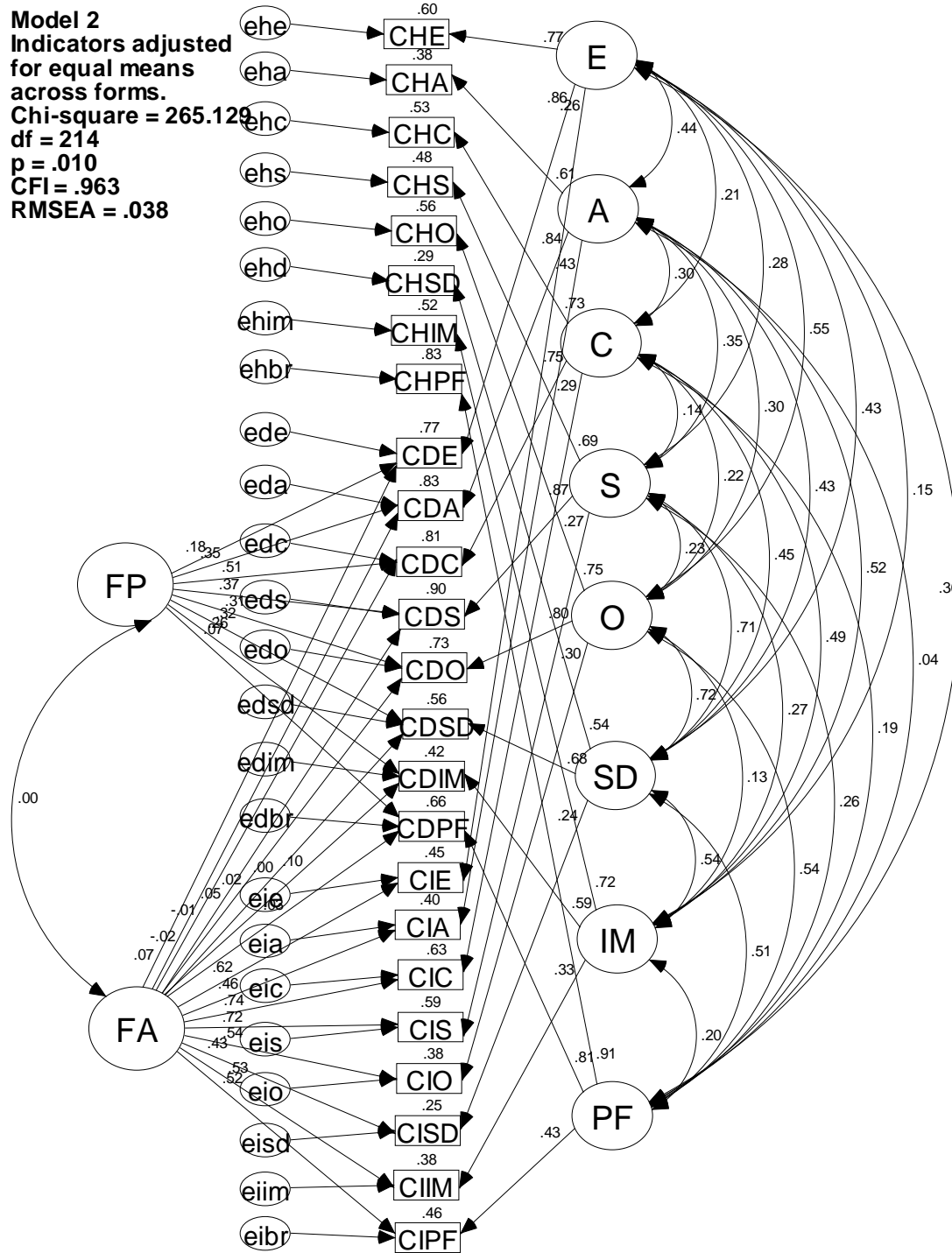


Figure 4. Model 2 completely standardized estimates. To achieve identification, correlation between FP and FA was fixed at 0. Loadings of incentive condition indicators on FA were .07, -.02, -.01, .05, .02, .00, and .10 from CDE to CDPF respectively.

Structural Model
 (Measurement model not shown)
 Chi-square = 279.839
 df = 228
 p = .011
 CFI = .963
 RMSEA = .037

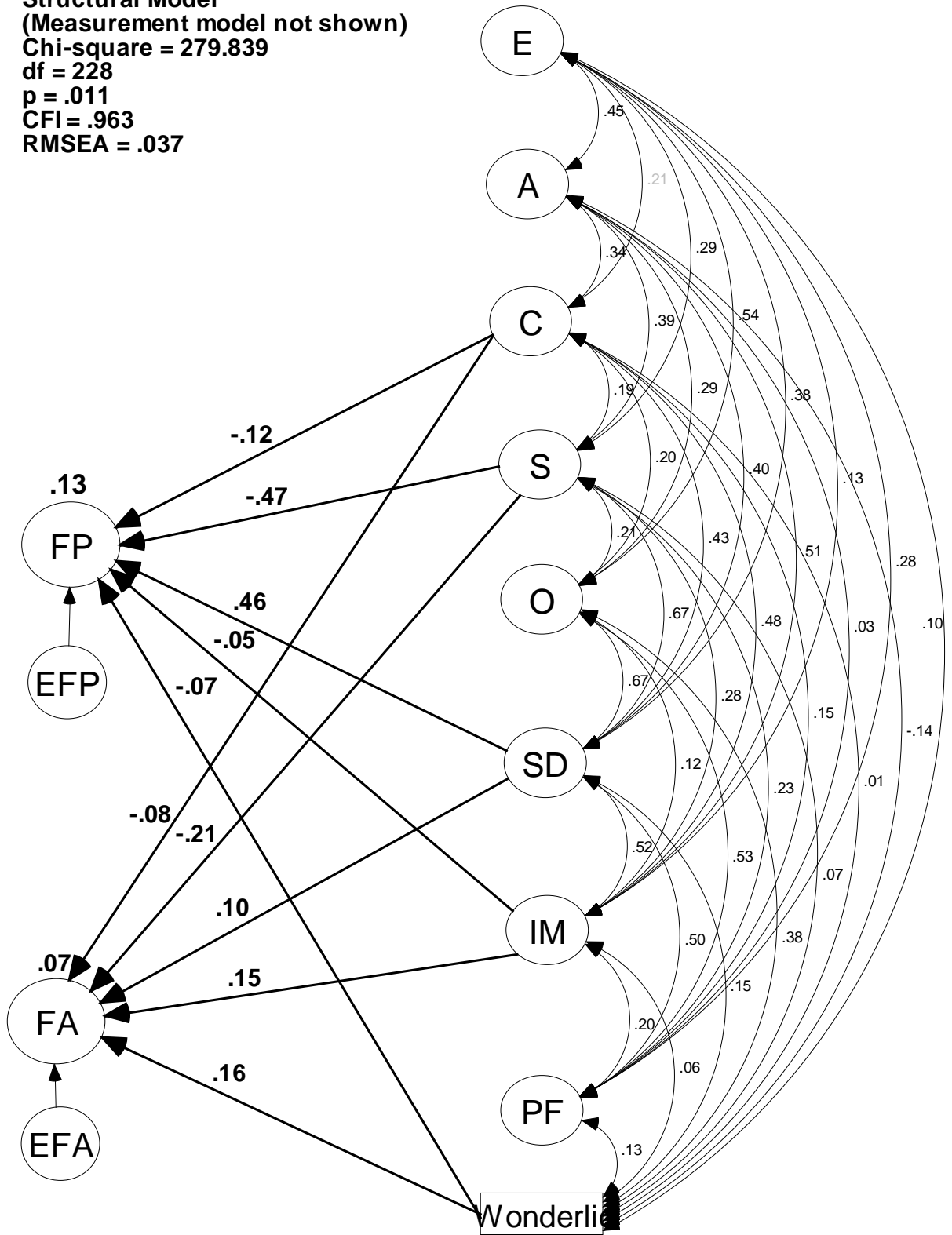


Figure 5. Model 3: Model 1 with selected structural hypotheses added. Measurement model is not shown. Completely standardized coefficients are presented.

Table 1. Means, Standard Deviations, and Correlations Between Measures

	HE	HA	HC	HS	HO	HSD	HIM	HPF	DE	DA	DC	DS	DO	DSD	DIM	DPF	IE	IA	IC	IS	IO	ISD	IIM	IPF	
HE	730																								
HA	306	710																							
HC	090	201	700																						
HS	089	212	049	780																					
HO	326	181	081	185	620																				
HSD	175	118	220	351	320	400																			
HIM	091	296	272	160	055	198	390																		
HPF	195	027	071	266	335	173	084	820																	
DE	663	212	138	125	354	245	160	268																	
DA	238	486	247	162	186	299	373	058	360																
DC	093	082	541	050	086	244	277	179	239	320															
DS	203	175	083	598	179	425	146	242	266	356	258														
DO	360	129	111	137	595	201	063	430	421	265	304	246													
DSD	180	160	183	274	387	389	209	388	298	318	377	506	532												
DIM	011	101	192	139	103	126	393	167	057	284	371	242	186	416											
DPF	191	033	025	155	318	157	081	733	237	069	242	188	390	326	240										
IE	129	171	025	067	192	067	-080	007	244	174	040	020	147	119	119	097									
IA	104	238	134	077	097	039	139	067	196	346	068	087	152	145	157	042	495								
IC	045	109	242	029	154	-023	080	094	058	028	212	005	088	157	216	190	496	426							
IS	038	042	111	203	038	114	125	097	102	062	093	213	098	160	191	139	449	475	538						
IO	097	160	087	038	210	038	009	155	110	134	104	013	274	215	163	171	458	541	503	396					
ISD	110	075	052	089	173	103	165	106	004	004	147	145	129	170	304	183	291	206	261	322	256				
IIM	001	071	056	105	085	000	248	083	089	123	084	049	012	094	314	152	296	280	398	418	232	356			
IPF	139	089	031	039	243	053	040	423	093	034	057	089	231	163	122	443	261	169	345	319	365	305	364		
M^a	4.36	4.99	4.36	3.93	4.68	4.40	3.88	3.21	4.68	5.20	4.77	4.44	4.92	4.60	4.22	3.28	5.30	5.56	5.60	5.25	5.36	5.09	4.90	3.99	
SD^b	0.94	0.85	0.91	0.98	0.79	0.81	0.93	0.60	1.00	0.82	0.96	1.05	0.83	0.81	0.96	0.67	0.80	0.73	0.82	0.83	0.71	0.79	0.96	0.67	

Note. Diagonal entries are reliability estimates from the honest instructional condition averaged across form.

^a Within each instructional condition, a form-specific constant was added to each score to equalize form means within the condition.

^b Standard deviations are based on pooled variances of forms across the six orders of administration.

Table 2. Structural Model Estimates.

Regression Weight	Unstandardized Estimate	Completely Standardized Estimate	Critical Ratio	p (two-tailed)
WLIC -> FP	-.005	-.070	-0.659	.510
C -> FP	-.077	-.117	-0.663	.507
S -> FP	-.319	-.467	-2.180	.029
SD -> FP	.473	.457	1.894	.058
IM -> FP	-.036	-.048	-0.255	.799
WLIC -> FA	.016	.156	1.827	.068
C -> FA	-.070	-.080	-0.623	.533
S -> FA	-.192	-.210	-1.490	.136
SD -> FA	.137	.099	0.584	.559
IM -> FA	.153	.152	1.093	.274

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Footnotes

¹ The model was applied to data for which means were not adjusted and no major differences between the two applications were found.

² Since three forms were used, an alternative model that is appropriate is one in which separate loadings for each form are estimated. This model was applied to the data allowing loadings to vary across forms and also applied constraining loadings to be equal across forms. A chi-square difference test between these two models yielded $X^2(60)=65.877$, $p > .05$. Thus the hypothesis of equality of loadings was retained.

³ Papers with Biderman as co-author can be found at www.utc.edu/Michael-Biderman