

# Assessing the Evaluative Content of Personality Questionnaires Using Bifactor Models

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## Bifactor Models of HEXACO-PI-R and NEO-FFI-3

Personality questionnaires are typically designed to reduce the evaluative content of personality items, yet recent research has identified a general factor present in personality measures that may be related to the desirability of the items themselves. To examine this finding, the present study applied exploratory and confirmatory bifactor analysis to responses on the NEO-FFI-3 and HEXACO-PI-R.

For both questionnaires bifactor models fit better than models without a general factor.

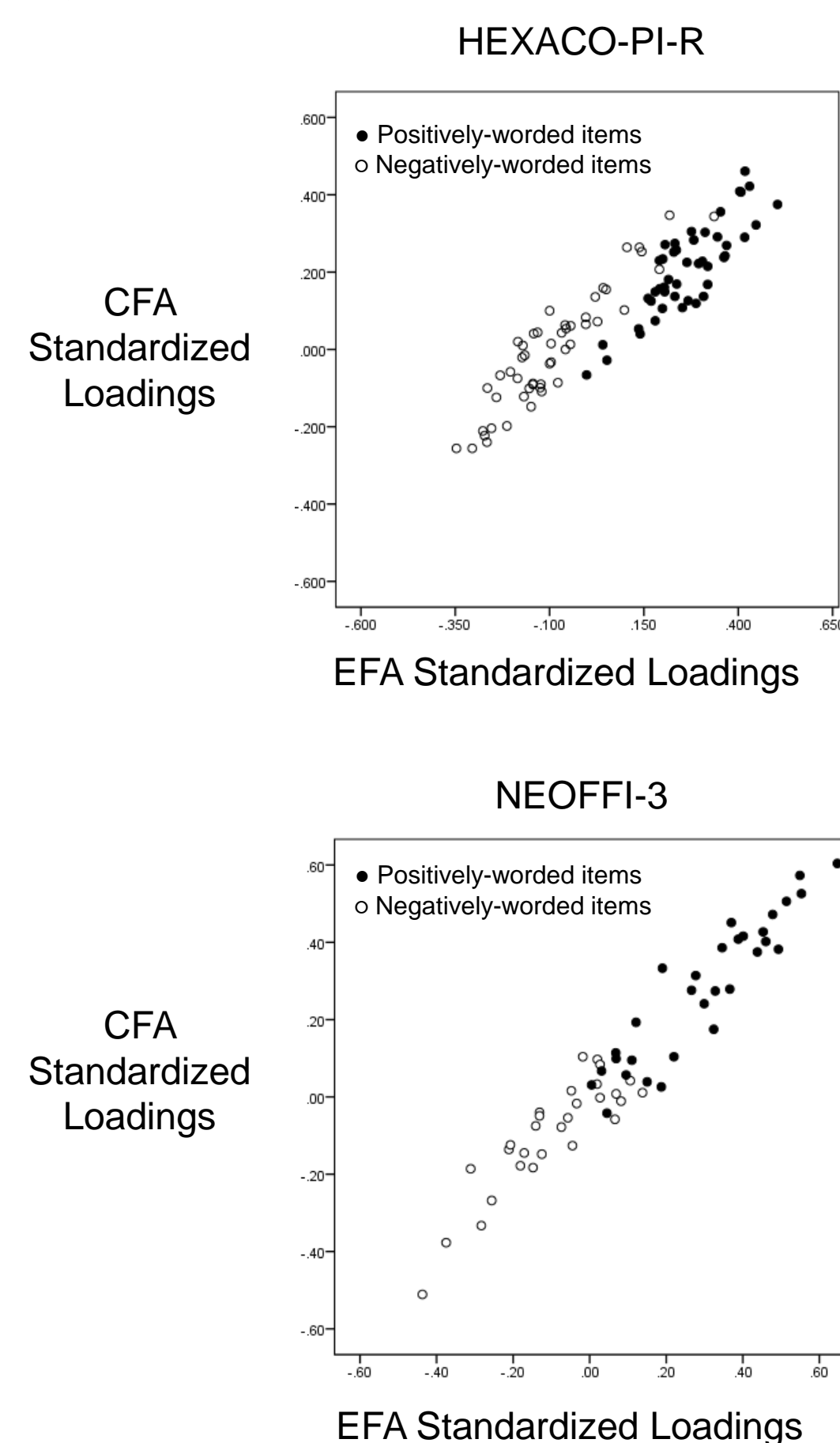
### Comparison of fit of models for HEXACO-PI-R; N=788

Model	$\chi^2$	df	RMSEA	CFI	SRMR	$\Delta\chi^2$	$\Delta df$
6 Factor EFA	6896.53	3855	.032	.884	.036		
Bifactor EFA	6302.49	3765	.029	.903	.030	594.04	90
6 Factor CFA	10206.84	4305	.042	.775	.070		
Bifactor CFA	9277.54	4224	.039	.807	.073		

### Comparison of fit of models for NEO-FFI-3; N=317

Model	$\chi^2$	df	RMSEA	CFI	SRMR	$\Delta\chi^2$	$\Delta df$
5 Factor EFA	2920.46	1480	.055	.780	.047		
Bifactor EFA	2626.20	1425	.052	.817	.042	294.26	55
5 Factor CFA	4034.85	1700	.066	.644	.089		
Bifactor CFA	3593.59	1650	.061	.703	.086		

For each questionnaire, standardized item loadings on the general factor estimated from the EFA bifactor model were nearly identical to item loadings on the general factor from the CFA model.

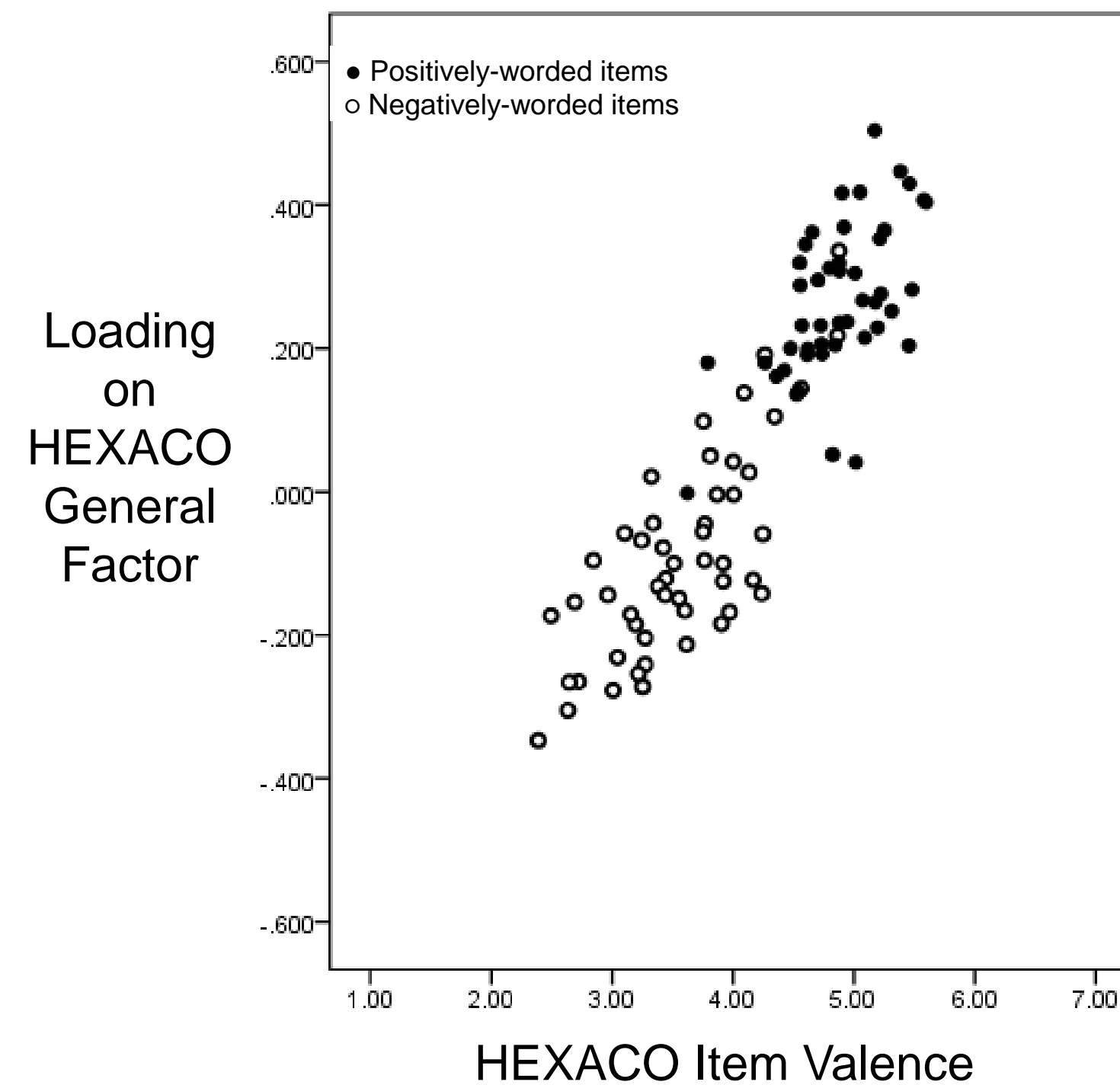


**Conclusion:** Bifactor models fit HEXACO-PI-R and NEO-FFI-3 items better than oblique factor models, providing evidence for a general factor.

## Importance of Item Evaluative Content

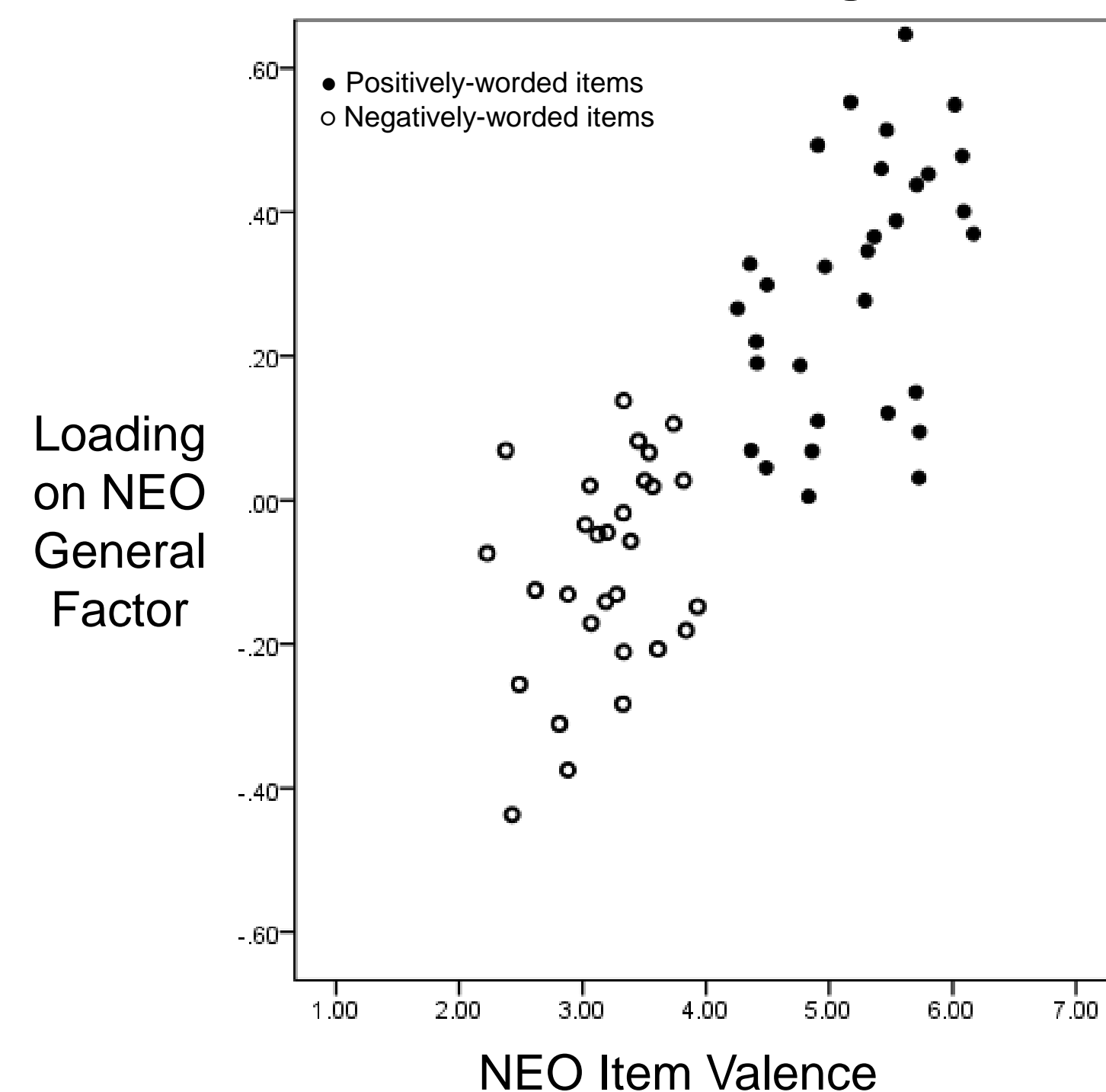
Mean valence ratings were obtained from a sample (N=336) separate from those to which models were applied. Participants rated items using "If a person had this characteristic, it would make him or her look (1= Absolutely Bad to 4=Neither Good nor Bad to 7=Absolutely Good)."

### HEXACO General Factor Loadings vs Valence



Overall Correlation = .89  
Positively-worded items correlation = .57  
Negatively-worded items correlation = .77

### NEO General Factor Loadings vs Valence



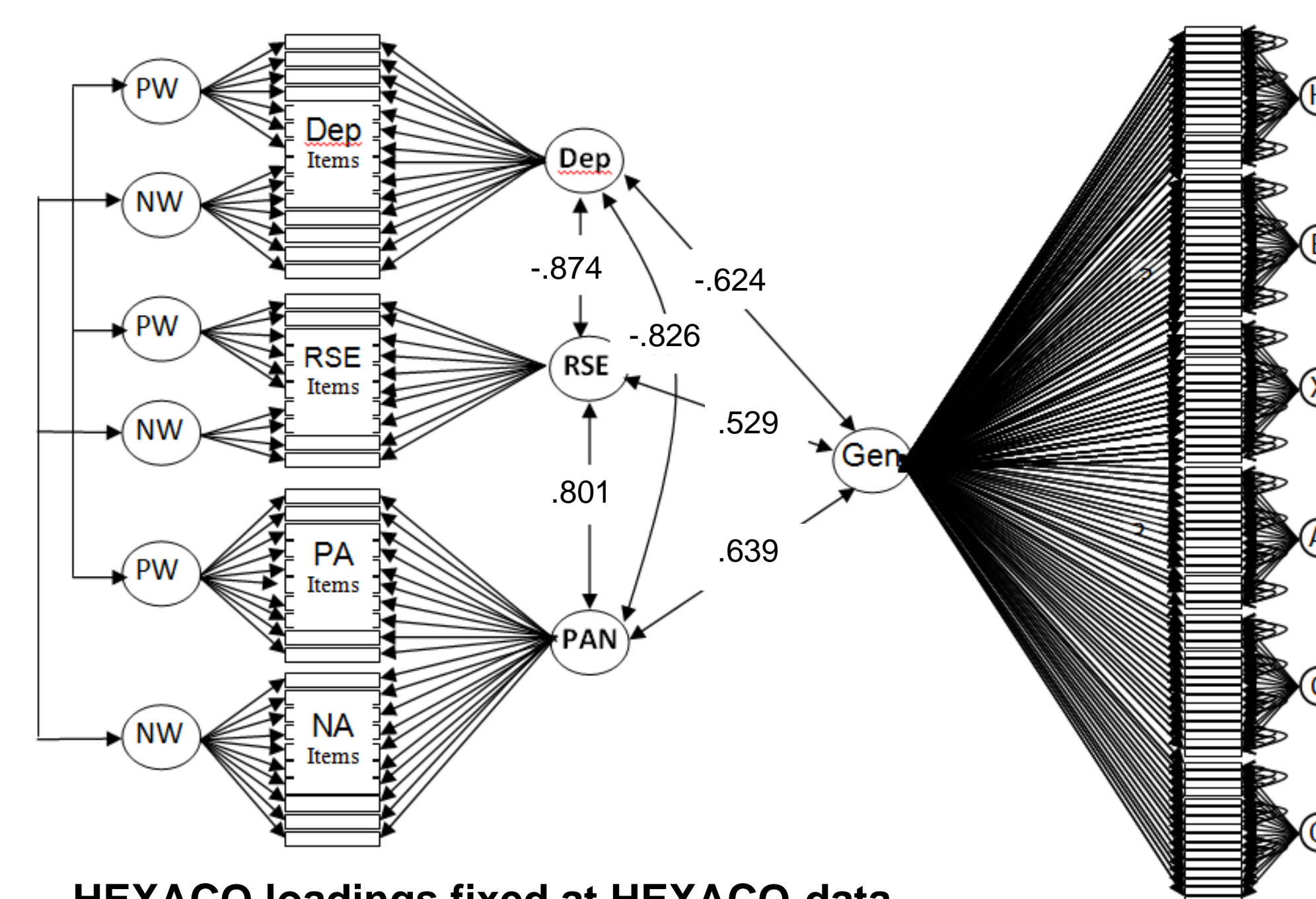
Overall Correlation = .80  
Positively-worded items correlation = .43  
Negatively-worded items correlation = .34

**Conclusion:** Influence of the general factor on items depends on item valence. General factor is a "content" factor.

## Characteristic represented by General Factor

Participants completed the Comrey and Costello (1967) Depression scale, the Rosenberg (1965) Self-esteem Scale and the PANAS (Watson, Clark, & Tellegen, 1988). Bifactor models were fit to the data of each scale and a meta-model of all the bifactor models was applied.

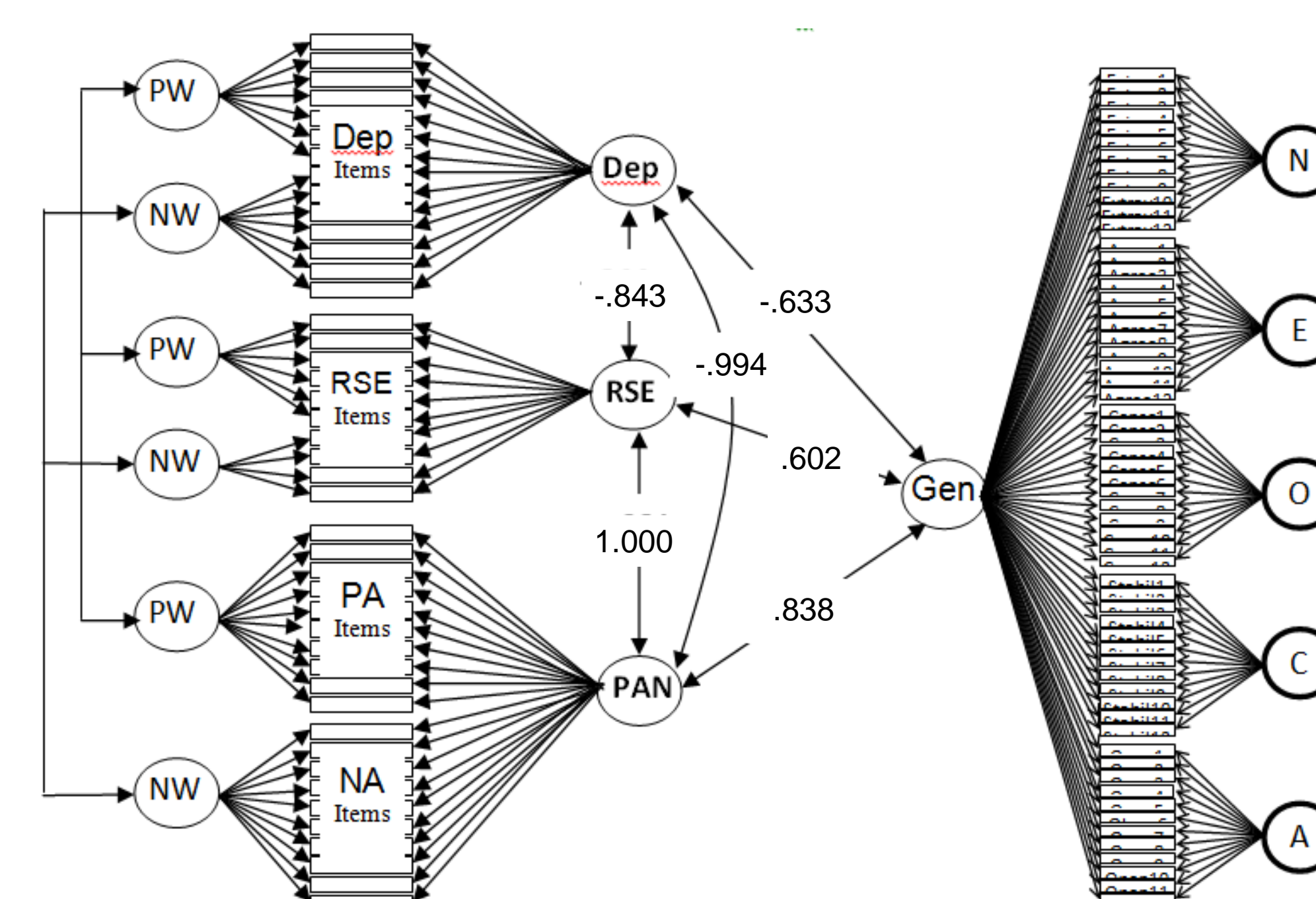
### Affect and HEXACO-PI-R Data



HEXACO loadings fixed at HEXACO-data-only values to prevent parameter drift.

Mean absolute value of correlations of HEXACO general factor with affect measure general factors = .60

### Affect and NEO-FFI-3 Data



NEO loadings fixed at NEO-data-only values to prevent parameter drift.

Mean absolute value of correlations of NEO general factor with affect measure general factors = .69

**Conclusion:** The general factors estimated from the HEXACO-PI-R and from the NEO-FFI-3 data each appear to represent general affect.

## General Factor Contamination of Scale Scores

### Correlators of Domains with Affect Measures (Factor Scores from EFA Bifactor Models)

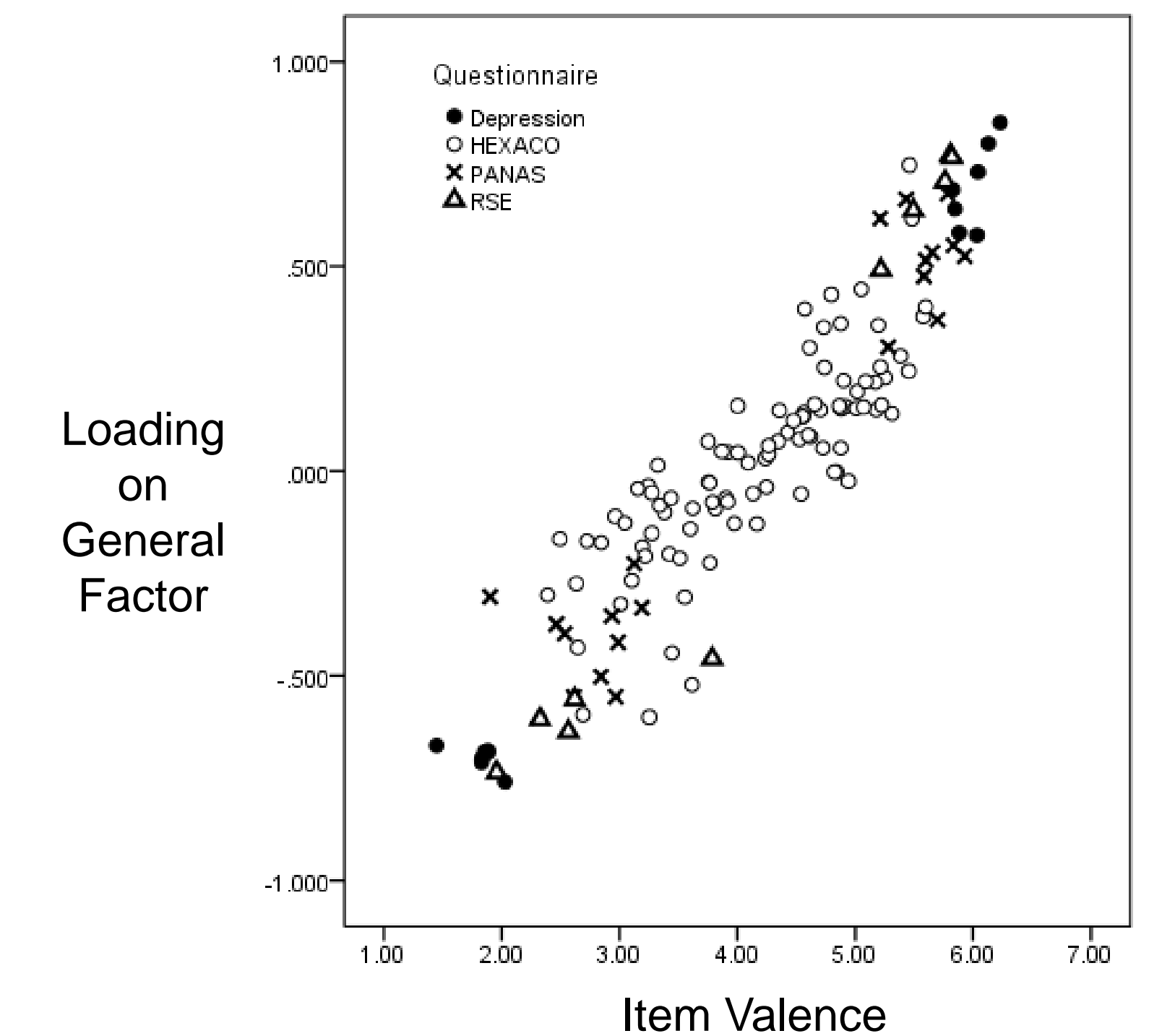
HEXACO	E	A	C	S	O	H
RSE: Scale Scores	.60	.14	.37	.14	-.02	.11
RSE: Factor Scores	.48	.08	.33	.16	-.13	-.02
PA: Scale Scores	.60	.10	.49	.06	.13	.14
PA: Factor Scores	.44	-.09	.37	.07	.01	-.06
Dep: Scale Scores	-.61	-.19	-.38	-.00	-.01	-.23
Dep: Factor Scores	-.48	-.11	-.30	-.03	-.11	-.03
NA: Scale Scores	-.46	-.34	-.29	-.30	-.04	-.17
NA: Factor Scores	-.36	-.31	-.25	-.27	.05	-.05
<b>Mean Abs Change</b>	<b>.13</b>	<b>.09</b>	<b>.06</b>	<b>-.01</b>	<b>.00</b>	<b>.16</b>
<b>Pct Abs Change</b>	<b>23</b>	<b>47</b>	<b>16</b>	<b>-8</b>	<b>00</b>	<b>98</b>

NEO	E	A	C	S	O
RSE: Scale Scores	.41	.13	.46	.62	.04
RSE: Factor Scores	.17	-.01	.30	.50	.05
PA: Scale Scores	.56	.23	.55	.34	.15
PA: Factor Scores	.30	.07	.39	.12	.13
Dep: Scale Scores	-.46	-.31	-.38	-.42	.00
Dep: Factor Scores	-.22	-.18	-.20	-.27	.01
NA: Scale Scores	-.26	-.20	-.36	-.66	-.11
NA: Factor Scores	-.10	-.13	-.20	-.57	.12
<b>Mean Abs Change</b>	<b>.22</b>	<b>.12</b>	<b>.17</b>	<b>.14</b>	<b>.06</b>
<b>Pct Abs Change</b>	<b>52</b>	<b>55</b>	<b>39</b>	<b>27</b>	<b>80</b>

**Conclusion:** General factor contaminates correlations with external variables.

## The Prevalence of the Effect of Item Valence

A model with one general factor influencing all questionnaire items was applied to the HEXACO and affect data.



Overall correlation = .92.  
Positively-worded items correlation = .83.  
Negatively-worded items correlation = .81.

**Conclusion:** The evaluative content of items of personality (Big Five, HEXACO) and affective questionnaires may be able to be modeled by a single affect factor.