A lexical investigation of the lower-order structure of conscientiousness[☆]

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Abstract

A principal components analysis of lexically derived trait adjectives was performed to investigate the lower-order factor structure of conscientiousness ($N = 1675$). A solution with eight substantive components fit the data best and showed good reliability, and convergent and discriminant validity. The eight components were labeled reliability, orderliness, impulse control, decisiveness, punctuality, formalness, conventionality, and industriousness. The relevance of the structure to previous lexical research and existing personality inventories is discussed.
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1. Introduction

The trait of conscientiousness has been receiving increasing attention because of its role in promoting positive social and individual outcomes across the life course. For example, measures of conscientiousness have been shown to predict job performance

(Hogan, Rybicki, Motowidlo, & Borman, 1998; Ones, Viswesvaran, & Schmidt, 1993), and long-term career success (Judge, Higgins, Thoresen, & Barrick, 1999). It also predicts college retention (Tross, Harper, Osher, & Kneidinger, 2000), marital stability (Kelly & Conley, 1987; Tucker, Kressin, Spiro, & Ruscio, 1998), healthy life-style behaviors (Booth-Kewley & Vickers, 1994; Clark & Watson, 1999), longevity (Friedman et al., 1993), and even eating habits (Goldberg & Stycker, 2002).

Although it is clear that conscientiousness is an important trait for social and individual functioning, it is unclear which aspects of conscientiousness are most relevant to specific outcomes. At the level of the Big Five, conscientiousness is a very broad domain, subsuming such diverse traits as impulse control, goal-directedness, planfulness, the ability to delay gratification, and the propensity to follow norms and rules (John & Srivastava, 1999). Moreover, many of the studies cited above used different definitions and measures of conscientiousness. Some researchers measured conscientiousness in terms of achievement, whereas others focused on order, impulse control, or responsibility.

At present, a replicable and widely accepted underlying structure of conscientiousness has yet to be determined. One reason for the lack of a replicable underlying structure is the relative newness of the Big Five taxonomy. Much of the recent research has appropriately focused on whether the Big Five are sufficient to capture the variance in most, if not all trait terms (e.g., Paunonen & Ashton, 2001; Paunonen & Jackson, 2000; Saucier & Goldberg, 1998) and the extent to which the Big Five are generalizable across cultures (Peabody & De Raad, 2002). Although there is agreement that there are five broad categories, and a willingness to settle on the gross features of those five domains, there is less agreement about the specific facets that make up each of the Big Five (Costa & McCrae, 1998). Identifying a replicable underlying structure of conscientiousness is important because lower-order facets of personality traits often provide better predictions of behavioral outcomes than composite measures (Ashton, 1998; Mershon & Gorsuch, 1988; Paunonen, 1998; Paunonen & Ashton, 2001).

One route to identifying the structure of conscientiousness is to examine lexically derived trait adjectives, as was done to develop the Big Five (e.g., Goldberg, 1993). There have been three studies to date using lexical systems to identify the lower-order structure of the Big Five. Saucier and Ostendorf (1999) used the abridged Big Five dimensional circumplex (AB5C) model (Hofstee, De Raad, & Goldberg, 1992) to select adjectives and then used hierarchical factor analysis to identify lower-order factors that would replicate across English and German languages. They found four facets of conscientiousness: Orderliness, industriousness, responsibility, and decisiveness. In a similar study based on an Italian lexicon, Perugini and Gallucci (1997) found four distinct factors: Meticulousness (akin to orderliness), superficiality (similar to industriousness), reliability, and recklessness. Moreover, Peabody and De Raad (2002) found independent evidence for facets that correspond to orderliness, responsibility, industriousness, and impulse control. They also identified a persistence factor that is a "transitional" domain between conscientiousness and extraversion. This persistence factor also loaded on the emotional stability factor in several samples and may therefore, be similar to the decisiveness factor described above.

Across these three studies, it appears that four factors replicated and a total of five unique facets emerged. The first factor that replicated was orderliness (or meticulousness—inaccuracy in Perugini & Gallucci), which reflects characteristics such as being neat and tidy. The second factor, reliability (or responsibility in Saucier & Ostendorf, 1999), is marked by adjectives such as responsible, conscientious, and dependable, and reflects a prosocial component of conscientiousness. The third replicable factor, industriousness (or its converse, superficiality in Peruguini & Gallucci) reflects a propensity to be hard working and not lazy, which should be highly relevant to outcomes such as job performance. The fourth facet of conscientiousness would be impulse control, which reflects the propensity to be careful and controlled (Peabody & De Raad, 2002). Finally, the fifth factor, decisiveness-consistency, reflects the propensity to behave in a firm and consistent fashion and would appear to be a blend of conscientiousness and emotional stability (Saucier & Ostendorf, 1999).

What has been absent to date is a psycholexical study that focuses on the domain of conscientiousness and that delves deeper into the lexicon of trait adjectives that mark the conscientiousness domain. Most of the previous psycholexical research has focused on creating marker sets for the Big Five (see Saucier, 2002 for a discussion) or on creating or maintaining a list of adjectives that was cross-culturally valid. Both of these strategies result in an abbreviated set of trait adjectives because their goal is to develop relatively orthogonal measures of the Big Five or find adjectives that perform equivalently across languages. Alternatively, one can sample broadly from the domain of conscientiousness and not be as concerned with the potential overlap with other trait domains. A broader search strategy has the potential strength of being more inclusive than the strategies used to develop marker sets and thus identify a maximum number of potential facets of conscientiousness.

In order to systematically assess the domain of conscientiousness, we used the abridged Big Five dimensional circumplex (AB5C) model of personality traits (Hofstee et al., 1992). According to the AB5C model, most trait terms are blends of two superordinate Big Five trait domains. Typically, a trait adjective will correspond highly to one of the Big Five and less strongly to a second of the Big Five. This fact allows for a relatively comprehensive definition of the domain of a given trait. In the case of conscientiousness, the domain consists of trait adjectives that load exclusively on conscientiousness and the remaining traits that load most highly on conscientiousness, and then secondarily to one of the remaining Big Five.

This exhaustive definition and sampling of the domain of conscientiousness also has the potential weakness of including facets of conscientiousness that are more appropriately categorized as belonging to other traits or as being transitional between trait domains (see Peabody & De Raad, 2002). To safeguard against this result, we tested the convergent and discriminant validity of the components of conscientiousness that emerged from the data and eliminated traits that were more strongly correlated with the remaining Big Five. In sum, the goals of the present study were (1) to maximize the coverage of the domain of conscientiousness so as to identify the full spectrum of traits underlying the superordinate domain of conscientiousness, and (2) not go too far and include traits that in reality belonged to the remaining Big Five.

2. Method

2.1. Participants

A total of 1675 individuals were used in this study. The total sample consisted of a compilation of various samples. The primary sample consisted of 1215 participants who provided self-report ratings of personality. This sample consisted of a group of undergraduates who completed ratings in return for partial class credit ($N = 1082$) and a second group ($N = 133$) of community members from the Champaign-Urbana area who agreed to complete questionnaires for pay. A subset of the undergraduates also provided acquaintance ratings of friends and family ($N = 460$). Fifty-nine percent of the participants and individuals targeted for ratings were female and the total sample ranged in age from 14 to 95 (average age 27.5).

2.2. Measures

Adjectives were selected from the abridged Big Five dimensional circumplex model (Hofstee et al., 1992). The AB5C maps trait adjectives in a series of circumplex structures (e.g., conscientiousness crossed with each of the remaining Big Five) rather than a hierarchical structure. This model provides a comprehensive taxonomy of trait terms because the majority of trait terms load onto two of the Big Five domains and can therefore, be considered blends of two factors (Saucier & Ostendorf, 1999). Thus, there are nine potential domains of conscientiousness: Core traits that do not cross-load, and additional facets that reflect trait adjectives that are primarily related to conscientiousness and secondarily related to one of the remaining Big Five (see Table 1). For example, the two facets that are derived from the conscientiousness-extraversion interface consist of a blend of high conscientiousness and high extraversion (e.g., alert, firm, and ambitious) and a blend of high conscientiousness and low extraversion (e.g., careful, formal, and cautious). As seen on Table 1, trait adjectives were selected that were either ''core'' adjectives of conscientiousness (adjectives without cross-loadings on the other Big Five) or that loaded primarily on conscientiousness and secondarily on one of the remaining Big Five.

Although the AB5C system is the most comprehensive lexical system published to date, there are several combinations of conscientiousness and other traits that are not populated by many trait terms in the AB5C model. For example, the combination of high conscientiousness and low agreeableness contains only three adjectives in the list of 540 trait adjectives that make up the AB5C model (i.e., stern, strict, and deliberate). In order to supplement the blends of conscientiousness that had low representation in the 540 AB5C system, we consulted a broader list of unpublished trait adjectives provided by Goldberg (1710 trait adjectives)[2] and added trait adjectives to under-represented domains so that each facet of conscientiousness would have approximately equal numbers of positively and negatively valenced trait adjectives. Ad-

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[2] The 1710 list of adjectives is available upon request from Lew Goldberg at lewg@ori.org.

Table 1
Trait Adjectives drawn from 540TDA and 1710TDA systems to assess domain of conscientiouness

III+	III+I+	III+I−	III+II+	III+II−	III+IV+	III+IV−	III+V+	III+V−
Organized	Alert	Careful	Responsible	Stern	Thorough	*Perfectionistic*	Industriousness	Conventional
Neat	Ambitious	Cautious	Dependable	Strict	Steady	*Ritualistic*	Perfectionistic	Traditional
Orderly	Firm	Punctual	Reliable	Deliberate	Consistent	*Overneat*	Sophisticated	Prim
Systematic	Purposeful	Formal	Mannerly	*Severe*	Self-disciplined	*Particular*	Dignified	
Efficient	Tenacious	Thrifty	Conscientious	*Unchangeable*	Decisive	*Overstrict*	Refined	
III−	III−I−	III−I+	III−II−	III−II+	III−VI−	III−IV+	III−V−	III−V+
Disorganized	Inefficient	Reckless	Unreliable	*Nonrigid*	Inconsistent	*Informal*	Haphazard	Unconventional
Disorderly	Lacy	Unruly	Negligent	*Lenient*	Scatterbrained	*Untidy*	Lax	*Unpunctual*
Careless	Indecisive	*Impulsive*	Undependable	*Unguarded*	Unstable		Foolhardy	*Uncivilized*
Unsystematic	Aimless	*Foolhardy*	Rash		Erratic		Lax	*Nonconforming*
Sloppy	Wishy-washy	*Uncautious*	Unmoralistic		Forgetful		*Unmethodical*	*Impish*

Note. Adjectives in normal script were taken from the 540TDA. Adjectives in italics were taken from the 1710TDA.
III+, high conscientiousness; III−, low conscientiousness; I+, high extraversion; I−, low extraversion; II+, high agreeableness; II−, low agreeableness: IV+, high emotional stability; IV−, low emotional stability; V+, high intellect; V−, low intellect.

jectives were selected based on their factor loading patterns (high conscientiousness and a secondary loading with the appropriate Big Five factor in the appropriate direction without loadings on the remaining Big Five). Table 1 shows the trait adjectives sampled for this study and the domains from which they were selected. Despite our efforts to find 10 items for each of the nine potential domains of conscientiousness several domains had fewer than 10 adjectives because we could not find enough trait adjectives that satisfied our inclusion criteria. This resulted in the selection of 83 (43 positive and 40 negative) trait adjectives that were potentially associated with the trait domain of conscientiousness.

In addition to the conscientiousness adjectives, participants rated 50 trait adjectives that were drawn from the 100 unipolar adjective markers of the Big Five factor structure developed by Goldberg (1992), representing the top five indicative and contra-indicative adjectives for each of the Big Five. These additional ratings were made in order to measure the Big Five and to relate the lower-order factor structure of conscientiousness to the Big Five. It should be noted that in Goldberg's system, the fifth dimension is described as Intellect rather than Openness. All adjectives were rated on a five-point scale from 1 (strongly disagree) to 5 (strongly agree).

2.3. Analyses

As a first step, we examined the mean ratings for self-report and acquaintance ratings and found them to be very similar. Therefore, we combined the self-report and acquaintance ratings to increase our sample size to create a more stable principal components solution. We also ipsatized individual items by subtracting a person's overall mean score on the set of unreflected conscientiousness items from each person's item ratings. Ipsatization effectively controls for some of the variance related to acquiescent responding and idiosyncratic scale usage (Ten Berge, 1999). To identify the lower-order structure of the conscientiousness domain, we performed a principal components analyses with an oblique rotation (oblimin). The oblique rotation was predicated on the expectation that the facets of conscientiousness would be intercorrelated and therefore, the component structure would not be orthogonal.

3. Results and Discussion

We performed principal components analyses on the 83 trait adjectives drawn from the combined 540 and 1710 lists. Twenty-one components had eigen values greater than one, and six had eigen values greater than two. The scree plot indicated small break points at six and eight components, but the breaks were not definitive. To be thorough, we examined oblique solutions with five, six, seven, eight, and nine components. Across all solutions, a problematic method component emerged that can best be described as an ''un,'' component. This component consisted solely of words that began with ''un'' such as unmannered, unmethodical, and unchangeable. It did not capture all of the words beginning with ''un,'' but did seem to consist of a relatively heterogeneous set of words that were not common in every day speech

(with the exception of unruly and uncivilized). Using the nine-component solution as a basis, we eliminated the "un" terms on this component from subsequent analyses if they did not have high secondary loadings on other factors.[3]

After eliminating the terms loading on the "un" component, we re-ran the analyses extracting five to ten components. The scree plot indicated no clear break after two factors. Nineteen components had eigen values greater than one, and six components had eigen values greater than two. We evaluated each solution based on the quality of the factors (high loadings for multiple items and few cross-loadings), replicability of previous factors found in the domain of conscientiousness (e.g., orderliness, responsibility, industriousness, and impulse control), and interpretability of the components. The nine-component solution that accounted for 40% of the variance replicated previous factors and was the most interpretable. It consisted of the following factors (in order of appearance in the components analysis): Orderliness (disorganized versus organized), strictness (strict versus lenient), decisiveness (decisive versus indecisive), industriousness (industrious versus lazy), impulse control (careful versus reckless), reliability (reliable versus unreliable), formalness (formal versus informal), punctuality (overprompt and punctual), and conventionality (unconventional versus conventional).

One distinct possibility was that the selection criterion for the trait adjectives was too broad and thus included trait terms more strongly associated with the remaining Big Five than to conscientiousness. In order to test this possibility, we computed scales based on the results of principle components analyses and correlated the resulting scales with the Big Five marker scales. The correlations revealed that the second component, strictness, was uncorrelated with conscientiousness ($r = -.09$) and highly, negatively correlated with agreeableness ($r = -.45$).

Subsequently, we dropped the adjectives that made up the strictness component and re-ran the principal components analysis.[4] We extracted five through ten components and used the same criteria described above to evaluate the different structures. The nine-component solution replicated previous research best and provided the most parsimonious interpretation of the additional components. The nine-component solution also was clearly an over-extraction, as one of the components was a "singlet" or a factor with only one substantial loading adjective (foolhardy) and two additional insubstantial loadings (haphazard and impish). Given the prevailing consensus that over-extracting leads to a more stable solution (Wood, Tataryn, & Gorsuch, 1996), and the clear interpretability of the remaining components we decided to focus on the nine-component solution. The 9-component structure accounted for 41% of the variance and is shown on Table 2.

The first component was labeled reliability, and consisted of adjectives such as unreliable (reversed), reliable, and dependable. Orderliness was the second component

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[3] The following adjectives from the "un" component were deleted from subsequent analyses were: Unmoralistic, unmannered, unmethodical, unsystematic, unguarded, unruly, uncivilized, and unchangeable.

[4] The following adjectives from the strictness component were deleted from subsequent analyses: Strict, stern, severe, overstrict, lenient, and nonrigid.

and it consisted of items such as organized, neat, and sloppy (reversed). These first two components replicated quite closely those found in three previous studies (Peabody & De Raad, 2002; Perugini & Gallucci, 1997; Saucier & Ostendorf, 1999). The third component, impulse control, consisted of adjectives such as careful, cautious, and reckless (reversed) and also closely replicated factors found by Peabody and De Raad (2002) and Perugini and Gallucci (1997). The fifth component, decisiveness, is a verbatim replication of Saucier and Ostendorf's decisiveness factor (with the addition of the terms "firm" and "alert"). Of the remaining components, the ninth, industriousness, marked by adjectives such as industriousness, lazy (reversed), and tenacious was a close approximation of industriousness factors found in the aforementioned studies.

The remaining four components were unique to this study. Clearly, the fourth component does not satisfy the basic criteria of being a sound component. Therefore, we chose not to interpret it or examine it further. The sixth component, punctuality, bordered on a singlet as it had only three high loading items. Nonetheless, the items loaded high enough to warrant further investigation. The seventh and eighth components reflected adjectives that blended conscientiousness and intellect found in the last two columns of Table 1. Formalness consisted of adjectives such as formal, sophisticated, and informal (reversed) that reflect high conscientiousness and high intellect. In contrast, conventionality, which consisted of adjectives such as traditional, conventional, and unconventional (reversed) reflected high conscientiousness and low intellect.[5]

As before, some of these components may have resulted from sampling adjectives too far removed from the domain of conscientiousness. To evaluate this possibility, we once again computed scales based on the results of the principal components analysis and tested their construct validity by correlating the eight substantive components with the Big Five and with sex and age (see Table 3; we did not score the Foolhardy singlet). Each scale correlated highest with conscientiousness, though the magnitude of convergent correlations varied. The five dimensions that corresponded to factors found in previous research, reliability, orderliness, impulse control, decisiveness, and industriousness, each had correlations above .50 with conscientiousness. The three facets unique to the present study, punctuality, sophistication, and conventionality had correlations that ranged from .34 to .39. In terms of discriminant validity, all of the scales were relatively unrelated to the remaining Big Five with the exception of reliability. The reliability scale also highly correlated with agreeableness ($r = .51$, $p < .05$) which was to be expected given the fact that the adjectives that make up this dimension were blends of conscientiousness and agreeableness. In addition, the pattern of correlations between intellect and both formalness and conventionality were small, but in the expected direction, with formalness being positively related to intellect and conventionality negatively related to intellect.

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[5] We chose to label the first two factors with the positive terms in order to have consistent labeling across the factors.

Table 2
Nine-component solution of lower-order structure of conscientiousness

	Reliability	Orderliness	Impulse control	Foolhardy singlet	Decisiveness	Punctuality	Formalness	Conventionality	Industriousness
Unreliable	−.796								
Reliable	.731								
Undependable	−.723								
Dependable	.658								
Responsible	.516								
Unstable	−.364				−.249				
Purposeful	.299								.209
Organized		−.808							
Neat		−.806							
Disorganized		.802							
Orderly		−.758							
Sloppy		.688							
Disorderly		.687							
Overneat		−.550				−.415			
Forgetful		.274			−.264			−.204	
Self-disciplined	.226	−.246							.231
Careful			.642						
Cautious			.575						
Reckless			−.552						
Careless			−.514						
Uncautious			−.489						
Impulsive	.218		−.470						
Rash			-.466						
Systematic			.363						.243
Conscientious	.297		.304						
Particular			.279					.227	.249
Erratic			−.261						
Ritualistic			.215					−.202	
Foolhardy				.901					
Haphazard			−.214	.322					
Impish				.308					
Indecisive					−.779				
Decisive					.756				

	1	2	3	4	5	6	7	8	9
Deliberate				.504					
Firm				.475					
Consistent			.318	.404					
Inconsistent			−.355	−.384					
Wishy-washy				−.367					
Alert	.202			.336					
Scatterbrained		.248		−.323					
Illogical				−.320					
Efficient	.203	−.254		.288					
Steady			.221	.273					
Overprompt						−.730			
Unpunctual	−.495					.608			
Punctual	.394					−.601			
Negligent			−.214			−.218			
Formal							.682		
Sophisticated							.605		
Refined							.592		
Prim							.512		
Informal							−.495		
Dignified							.484		
Mannerly							.292		
Ambitious	.203				.249		.269	.247	
Traditional								−.595	
Conventional								−.575	
Unconventional						−.261		.509	
Nonconforming						−.241		.410	
Perfectionistic			.268				.237	.398	
Inefficient				−.208			−.208		
Laz									−.519
Lazy		.215							−.492
Tenacious									.489
Industriousness									.484
Thrifty						−.204			.310
Thorough			.223					.211	.264
Aimless									

Note. N = 1632. Loadings below .20 are not shown.

Table 3
Reliability and correlates of lower-order facets of conscientiousness

	Alpha reliability	Extra-version	Agree-ableness	Conscien-tiousness	Emotional stability	Intellect	Sex	Age
Reliability	0.84	**0.16**	**0.51**	**0.56**	**0.29**	**0.35**	**0.15**	**0.11**
Orderliness	0.87	**0.05**	**0.16**	**0.83**	**0.08**	**0.05**	**0.10**	**0.18**
Impulse control	0.73	**−0.09**	**0.36**	**0.66**	**0.20**	**0.15**	**0.14**	**0.24**
Decisiveness	0.78	**0.21**	**0.19**	**0.61**	**0.32**	**0.24**	**−0.07**	**0.21**
Punctuality	0.69	**−0.06**	0.04	**0.39**	0.01	0.02	0.02	**0.13**
Formalness	0.70	0.03	**0.11**	**0.36**	0.01	**0.17**	**−0.06**	0.03
Conventionality	0.63	0.04	**0.18**	**0.34**	0.04	**−0.11**	**0.09**	**0.24**
Industriousness	0.55	**0.16**	**0.19**	**0.51**	**0.13**	**0.22**	**0.10**	**0.30**

Note. $N = 1627$ for Big Five correlations and 1532 for demographic correlations; Correlations shown in bold are statistically significant at $p < .05$. Sex was scored male = 0, female = 1.

We also related the conscientiousness scales to sex (male = 0, female = 1) and to age (see Table 3). Women tended to score higher than men on reliability, impulse control, conventionality, and industriousness dimensions, and lower on decisiveness and formalness, although the effect sizes were quite small. With the exception of formalness, all of the scales were positively correlated with age, which is consistent with previous research showing that conscientiousness tends to increase with age (Goldberg, Sweeney, Merenda, & Hughes, 1998; Helson & Kwan, 2000). The internal consistency reliability estimates were, for the most part, good, with the exception of industriousness which had a lower than optimal alpha reliability ($\alpha = .55$).

Finally, to provide another test of whether these dimensions were tapping into one construct, we performed a principal components analysis on the eight scales. The correlations among the scales were all positive and ranged from .15 to .54. A principal components analysis with an oblique rotation showed two factors with eigen values over one. The first factor consisted of reliability, decisiveness, industriousness, impulse control and orderliness. The second factor consisted of formalness and conventionality. The punctuality scale cross-loaded evenly on both components. The resulting components were positively correlated ($r = .40$), indicating the existence of two related components that both tap into the domain of conscientiousness.

4. General Discussion

The results of our study replicated and extended previous research on the lexical structure of conscientiousness. We clearly identified five components found in previous lexical research on the lower-order structure of conscientiousness: Orderliness, decisiveness, reliability, impulse control, and industriousness. Close examination of the content of the factors indicates that the orderliness, decisiveness, reliability, and industriousness components are clear replications of factors of the same name found by Saucier and Ostendorf (1999). The orderliness, reliability, and industriousness components also are close approximates of Peabody and De Raad's (2002) orderliness, responsibleness, and work factors. In addition, the impulse control factor

found in the present study is similar to the impulse control factor found by Peabody and De Raad (2002), although their factor was broader and more heterogeneous in content.

It should be noted that the reliability factor in the present study was related equally to conscientiousness and agreeableness. This was not unexpected, as the adjectives that mark this component were those that blended conscientiousness and agreeableness in the first place (see Table 1). Nonetheless, the magnitude of the correlation with agreeableness would indicate that this version of reliability may be a transitional dimension lying between the two superordinate domains of conscientiousness and agreeableness. This may also help to explain one of the points of contention between proponents of Eysenck's Big Three model of personality and the Big Five (e.g., Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993). It may be that personality inventories that emphasize the domain of responsibility in their assessment of conscientiousness are more likely to result in a single factor subsuming both agreeableness and conscientiousness, such as psychotocism.

Unlike previous research, we also found punctuality, formalness, and conventionality components. Punctuality is clearly a narrow scale that may not deserve to be considered a true facet of conscientiousness. Rather this component may be something akin to what Saucier (2002) would describe as a "parcel"—a small cluster of items so semantically similar that they are best aggregated into one score. On the other hand, the existence of the formalness and conventionality components is both interesting and a unique finding. No previous analysis has identified these dimensions as belonging to the domain of conscientiousness. Peabody and De Raad (2002) found a similar dimension, but identified it as separate from the Big Five. The different location of conventionality in their solution may have been the result of differences in the composition of the domain, as their definition of conventionality was broader and included religious and ideological terms, whereas our conventionality component was more narrowly focused on traditionality. It may be the latter aspect of conventionality that is related to conscientiousness and not the broader interpretation.

Based on face validity, the formalness dimension appears similar to what might be termed culture and would then arguably be more related to openness than conscientiousness. Interestingly, neither formalness nor conventionality was strongly related to the Big Five Intellect scale. The latter may be telling, because formalness and conventionality may be more strongly related to alternative interpretations of factor five, such as the openness to experience interpretation of the fifth factor found in the NEO or the original idea that this domain was best understood as culture (Johnson, 1994). In general, we believe that the evidence for including formalness and conventionality in a model of conscientiousness is provisional at best. Nonetheless, we feel that the evidence is strong enough to warrant further investigation of these facets and additional tests of whether they relate more strongly to other domains of personality. Specifically, future research should investigate the convergence of these scales with broader definitions of factor five.

One interesting question is how this model of conscientiousness corresponds to the numerous personality inventories in existence, including those purported to

assess the subfacets of the Big Five. For example, the NEO-PI-R (Costa & McCrae, 1994) has six lower-order subscales, which largely overlap conceptually with this structure, but it does not have scales strongly related to decisiveness, formalness, or conventionality. The most interesting omission from existing personality inventories is a good measure of decisiveness. Given the relevance of conscientiousness to the world of work, it seems that a measure of decisiveness would be highly relevant to occupational phenomena such as leadership ability and management performance. Although more comprehensive than most personality inventories, this model of conscientiousness also appears to lack dimensions found in some inventories, especially those dimensions related to being virtuous and moralistic (e.g., the HPI Virtuous scale, Hogan & Hogan, 1992). This dimension of conscientiousness may not appear in the lexicon of trait adjectives because of the choices made in the adjective set development process, which often resulted in the elimination of strongly evaluative terms (Block, 1995). Clearly, future research should test the relationship between adjectival models of conscientiousness and the plethora of inventories that tap into this domain.

This study was not without limitations. First, the structure relies entirely on the adjectives found in the AB5C system, which is one of several ways of identifying a candidate list of trait adjectives for lexical research. Alternatively, one could randomly select adjectives from the dictionary and focus only on those adjectives deemed to be strongly related to conscientiousness. If done over a number of iterations, this type of approach may result in either a different factor structure or a factor structure with a different blend of adjectives (see Benet & Waller, 1995). Furthermore, the adjectives found in the lexicon may not contain psychologically relevant aspects of conscientiousness that derive from theoretical insights (e.g., ego control, harm avoidance, super-ego strength, etc.), making it possible that new components of conscientiousness have yet to be discovered. A test of the lower-order structure of existing scales drawn from personality inventories would help clarify the scope of the lexical results and provide an indication as to whether additional components of conscientiousness need to be included in the model.

We believe that this model of conscientiousness constitutes one step in the long process of identifying a reliable structure of traits that make up the domain of conscientiousness. A replicable lower-order taxonomy may be instrumental in expanding our understanding of how conscientiousness is related to important social and individual outcomes. It is quite likely that specific facets of conscientiousness are more important for specific outcomes than others. For example, impulse control may be more relevant to health behaviors than a factor such as order. Having an exhaustive and replicated structure will allow us to generate more fine-grained results and enhance our understanding of the role of conscientiousness across the life course.

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