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The Effect of Response Format on the Psychometric Properties of the Narcissistic Personality Inventory: Consequences for Item Meaning and Factor Structure

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Abstract

The Narcissistic Personality Inventory (NPI) is currently the most widely used measure of narcissism in social/personality psychology. It is also relatively unique because it uses a forced-choice response format. We investigate the consequences of changing the NPI's response format for item meaning and factor structure. Participants were randomly assigned to one of three conditions: 40 forced-choice items (n = 2,754), 80 single-stimulus dichotomous items (i.e., separate true/false responses for each item; n = 2,275), or 80 single-stimulus rating scale items (i.e., 5-point Likert-type response scales for each item; n = 2,156). Analyses suggested that the "narcissistic" and "nonnarcissistic" response options from the Entitlement and Superiority subscales refer to independent personality dimensions rather than high and low levels of the same attribute. In addition, factor analyses revealed that although the Leadership dimension was evident across formats, dimensions with entitlement and superiority were not as robust. Implications for continued use of the NPI are discussed.

Keywords

narcissism, forced choice, Narcissistic Personality Inventory, factor analysis, response format

Since the introduction of narcissistic personality disorder as its own diagnostic entity in the third edition of the *Diagnostic and Statistical Manual*, a number of self-report instruments have been developed to assess the multifaceted construct of narcissism. The Narcissistic Personality Inventory (NPI; Raskin & Terry, 1988) is the most commonly used measure of narcissism in social and personality psychology (over 75% of studies use it; see Cain, Pincus, & Ansell, 2008). Accordingly, the NPI has had a major impact on the prevailing conceptualization and understanding of narcissism in this subdiscipline (see Table 1 for the items along with some common dimensional solutions). However, a number of research groups have raised concerns about the NPI's internal consistency, factor structure, and construct validity (Ackerman et al., 2011; Brown, Budzek, & Tamborski, 2009; del Rosario & White, 2005; Pincus & Lukowitsky, 2010). These concerns indicate the need for more research on the psychometric properties of the NPI to better understand how narcissism is measured in social/personality psychology. This information will benefit researchers, within this subdiscipline and in allied fields like clinical psychology, who wish to interpret the NPI literature.

The NPI is relatively unique among measures that are widely used in social and personality psychology because it consists of 40 *pairs* of items in a forced-choice format. Participants are told to select the item from each pair that better represents their own feelings and beliefs. In contrast, most other constructs in social/personality psychology are typically assessed by asking participants to respond to *single* items using Likert-type response scales (i.e., single-stimulus response formats). Perhaps because of this, some research groups have used single-stimulus response format versions of the NPI in their empirical work (e.g., Gerbasi & Prentice, 2013; Lee, Gregg, & Park, 2013).

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Table 1. Common Dimensional Solutions to the Narcissistic Personality Inventory.

	Options		Structural solutions		
Item	Option A	Option B	RASKIN	EMMONS	ACK
1	I have a natural talent for influencing people.	I am not good at influencing people.	AU	LA	LA
2	Modesty doesn't become me.	I am essentially a modest person.	EX		
3	I would do almost anything on a dare.	I tend to be a fairly cautious person.	EX	SA	
4	When people compliment me I sometimes get embarrassed.	I know that I am good because everybody keeps telling me so.	SU	SS	GE
5	The thought of ruling the world frightens the hell out of me.	If I ruled the world it would be a much better place.	ET		LA
6	I can usually talk my way out of anything.	I try to accept the consequences of my behavior.	EP	SA	
7	I prefer to blend in with the crowd.	I like to be the center of attention.	EX	LA	GE
8	I will be a success.	I am not too concerned about success.	AU		
9	I am no better or no worse than most people.	I think I am a special person.	SU	SS	
10	I am not sure if I would make a good leader.	I see myself as a good leader.	AU	LA	LA
11	I am assertive.	I wish I were more assertive.	AU	LA	LA
12	I like having authority over people.	I don't mind following orders.	AU	LA	LA
13	I find it easy to manipulate people.	I don't like it when I find myself manipulating people.	EP	EE	EE
14	I insist upon getting the respect that is due me.	I usually get the respect that I deserve.	ET	EE	EE
15	I don't particularly like to show off my body.	I like to display my body.	VA	SS	GE
16	I can read people like a book.	People are sometimes hard to understand.	EP	SA	
17	If I feel competent I am willing to take responsibility for making decisions.	I like to take responsibility for making decisions.	SS		
18	I just want to be reasonably happy.	I want to amount to something in the eyes of the world.	ET		
19	My body is nothing special.	I like to look at my body.	VA	SS	GE
20	I try not to be a show off.	I am apt to show off if I get the chance.	EX	SA	GE
21	I always know what I am doing.	Sometimes I am not sure of what I am doing.	SS	SA	
22	I sometimes depend on people to get things done.	I rarely depend on anyone else to get things done.	SS		
23	Sometimes I tell good stories.	Everybody likes to hear my stories.	EP	SA	
24	I expect a great deal from other people.	I like to do things for other people.	ET	EE	EE
25	I will never be satisfied until I get all that I deserve.	I take my satisfactions as they come.	ET	EE	EE
26	Compliments embarrass me.	I like to be complimented.	SU	SS	GE
27	I have a strong will to power.	Power for its own sake doesn't interest me.	ET	EE	LA
28	I don't very much care about new fads and fashions.	I like to start new fads and fashions.	EX		GE
29	I like to look at myself in the mirror.	I am not particularly interested in looking at myself in the mirror.	VA	SS	GE
30	I really like to be the center of attention.	It makes me uncomfortable to be the center of attention.	EX	LA	GE
31	I can live my life in any way I want to.	People can't always live their lives in terms of what they want.	SS		
32	Being an authority doesn't mean that much to me.	People always seem to recognize my authority.	AU	LA	LA
33	I would prefer to be a leader.	It makes little difference to me whether I am a leader or not.	AU	LA	LA
34	I am going to be a great person.	I hope I am going to be successful.	SS	SS	LA
35	People sometimes believe what I tell them.	I can make anybody believe anything I want them to.	EP	SA	
36	I am a born leader.	Leadership is a quality that takes a long time to develop.	AU	SA	LA
37	I wish somebody would someday write my biography.	I don't like people to pry into my life for any reason.	SU		
38	I get upset when people don't notice how I look when I go out in public.	I don't mind blending into the crowd when I go out in public.	EX	EE	GE
39	I am more capable than other people.	There is a lot that I can learn from other people.	SS	EE	
40	I am much like everybody else.	I am an extraordinary person.	SU	SS	LA

Note. RASKIN = Raskin and Terry (1988) dimensional solution; EMMONS = Emmons (1984, 1987) dimensional solution; ACK = Ackerman et al. (2011) dimensional solution; For Raskin and Terry (1988): AU = authority, EX = exhibitionism, SU = superiority, ET = entitlement, EP = exploitativeness, VA = vanity, and SS = self-sufficiency; For Emmons (1984, 1987): LA = leadership/authority, SA = superiority/arrogance, SS = self-absorption/self-admiration, and EE = exploitativeness/entitlement; For Ackerman et al. (2011): LA = leadership/authority, GE = grandiose exhibitionism, and EE = entitlement/exploitativeness.

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Although such apparently straightforward trans-formations of the NPI items seem inconsequential, we believe any modifications should be made with care. After all, the items from the forced-choice response format may not mean the same thing to participants when each item is presented in isolation. While some of the NPI item pairs may better reflect a multidimensional measurement framework, other item pairs may better reflect a unidimensional measurement framework.[1] According to the unidimensional framework, each item in a forced-choice pair represents two different levels of the same attribute (typically, high vs. low). Within the multidimensional framework, however, the two options reflect *different* attributes or traits. Accordingly, participants are asked to compare one dimension with a separate dimension and select which of two conceptually distinct traits is more self-descriptive. In short, these different kinds of measurement frameworks require respondents to make different kinds of judgments about themselves. However, because little is known about how the NPI options were paired together during the initial scale construction phases (see Raskin & Hall, 1979), it is an open question as to which framework best represents the item pool.

To our knowledge, no research team has investigated whether the individual NPI items better conform to a unidimensional or multidimensional framework. This is an important topic because it has implications for how the NPI is interpreted. Indeed, for a given multidimensional item pair (e.g., Trait A vs. Trait B), participants' selection of Trait A means that they perceive Trait A to be more self-descriptive than Trait B. Such a response does not necessarily mean that participants are high on Trait A (or low on Trait B) in absolute terms. This affects the interpretation of the total score for scales based on multidimensional item pairs and means that between-person comparisons must be made with caution. Whereas unidimensional items provide information that allow for interindividual comparisons (in principle), multidi-mensional items provide information that allow for intraindividual comparisons (Hicks, 1970). This issue may also have consequences for the factor solutions that are derived from the instrument. If the item pairs are largely unidimensional, then similar factor structures should emerge with forced-choice pairs and single-stimulus ratings. If item pairs are multidimensional, however, different factor structures may emerge across different item response formats.

Accordingly, the present research evaluates the consequences of response format for item meaning and factor structure by comparing participants' responses with the NPI using one of three possible response formats: the traditional 40 forced-choice items, 80 single-stimulus dichotomous items (i.e., separate true/false responses for each option), or 80 single-stimulus rating scale items (i.e., 5-point Likert-type response scales for each option). We first test how the paired response options correlate with one another when they are administered as separate responses to determine whether the forced-choice item pairs better conform to a unidimensional or multidimensional measurement framework.[2] We then investigate the generalizability of the NPI's factor structure across the three response formats to determine whether the factor structure underlying the NPI is format dependent.

Implications of Response Format for Item Meaning and Factor Structure

Newer instruments developed to assess narcissism (e.g., the Narcissistic Admiration and Rivalry Questionnaire; Back et al., 2013; the Pathological Narcissism Inventory; Pincus et al., 2009) have adopted a single-stimulus response format for the items. This format differs from the forced-choice response format in that only a single question is presented to participants. Thus, rather than choosing which of two statements is more self-descriptive, participants make judgments about a single attribute of interest using a Likert-type rating scale.

It is possible to break the NPI item pairs into single statements and thus modify the instrument to possess a single-stimulus response format. A single-stimulus dichotomous response format for the NPI (i.e., responding true or false to a given statement) asks participants to decide whether the statement describes them or not, whereas a Likert-type response scale asks participants to make finer-grain distinctions concerning how strongly they endorse (or reject) a particular item. The process of responding no longer requires individuals to make comparative judgments between two statements. Table 2 presents examples of these different formats for Item 24 from the NPI.

To investigate the issue of unidimensional versus multidimensional measurement, we calculate correlations between the two paired response options for each item when administered separately. A relatively weak correlation (regardless of sign) between Option A and Option B (e.g., $r = -.10$) would suggest that the two options are likely capturing different traits and therefore that the forced-choice task is essentially multidimensional. In contrast, a moderate to strong negative correlation (e.g., $r = -.40$) would suggest that the two response options are likely capturing a similar trait (albeit at opposing ends of the same continuum) and therefore that the item pair is essentially unidimensional. A moderate to strong positive correlation would also suggest that the two response options are likely capturing a similar trait; however, this would constitute a peculiar scenario given that participants seem to endorse both options. In any case, evaluation of these correlations provides insights into the interpretation of NPI responses when the item pairs are presented together in the standard forced-choice format administration.

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Table 2. Item 24 from the Narcissistic Personality Inventory in Forced-Choice, Single-Stimulus Dichotomous, and Single-Stimulus Rating Scale Formats.

Forced-choice response format
Instructions: Please read each pair of statements and then choose the one that is closer to your own feelings and beliefs. a. I expect a great deal from other people. b. I like to do things for other people.
Single-stimulus dichotomous response format
Instructions: Please respond to each of the following statements with either True or False. I expect a great deal from other people. *True/False* I like to do things for other people. *True/False*
Single-stimulus rating scale response format
Instructions: Please use the following scale to indicate how much you agree with each of the following statements. 1 = *strongly disagree* 5 = *strongly agree* I expect a great deal from other people I like to do things for other people.

There is no guarantee that the NPI exhibits the same factor structure across response formats—especially if some items on the NPI better conform to a multidimensional framework of measurement. Consistent with other studies evaluating the generalizability of factor solutions for inventories across multiple response formats (especially for inventories originally developed as forced-choice; see Barnett & Lanier, 1995; Gray & Wilson, 2007), we investigate whether the factor structure of the NPI generalizes across the three distinct response formats (i.e., forced-choice, single-stimulus dichotomous, and single-stimulus rating scale). The results of these analyses are important because they shed insight into whether similar constructs are captured across the response formats. From a more pragmatic perspective, they also inform how the instrument should be scored in terms of subscales for single-stimulus response formats.

Method

Participants and Procedure

All data for this study came from participants who completed an internet survey, which was one of several autoscoring personality tests on the website, *your personality* (http://www.yourpersonality.net/). As an incentive, each of the tests provided participants with highly detailed feedback about their scores. Because there was no explicit recruitment or advertising for this study, participants included anyone who came across the website and decided to complete the survey.

After consenting to participate, participants were randomly assigned to one of three NPI response format conditions: forced-choice, single-stimulus dichotomous, or single-stimulus rating scale. In each condition, the NPI items were presented in a random order. That is, the order of the items provided to each participant was randomly determined from all possibilities when the page was loaded. Participants also completed demographic information (i.e., gender; age; country; political orientation; religion; education; whether involved in a romantic relationship and if so, for how long; and socioeconomic status; in the forced-choice condition, participants reported on variables related to subjective well-being). Several measures were taken to ensure high data quality. Participants who indicated taking the survey a previous time were removed. Likewise, a random digit sequence was assigned covertly to participants whenever they accessed the consent page; repeats of random digit sequences were removed to ensure that the same participants who submitted the page twice or went backward through the survey did not have their data counted more than once. We also filtered out participants who reported being less than 18 years or greater than 65 years. The final sample consisted of 7,185 participants; 71.1% were women and 52.6% were from the United States.

There were no significant differences between the conditions in terms of gender, $\chi^2(2) = 1.92$, $p = .383$, country of origin, $\chi^2(258) = 252.95$, $p = .577$, political orientation, $\chi^2(22) = 20.33$, $p = .562$, religion, $\chi^2(18) = 17.06$, $p = .519$, education, $\chi^2(24) = 25.63$, $p = .372$, and socioeconomic status, $\chi^2(18) = 24.01$, $p = .155$. In contrast, participants' ages were significantly different across the conditions, $F(2, 7{,}182) = 5.81$, mean squared error = 130.31, $p = .003$; however, differences in participants' ages between these conditions were slight (Cohen's *d*s ranged from −.02 to −.09). Similarly, participants' involvement in a romantic relationship was

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significantly different across the conditions, $\chi^2(2) = 7.84$, $p = .02$; nevertheless, the phi correlation was .033, thus suggesting a very small association between the two variables. Taken together, these findings suggest that the random assignment was largely successful.

Forced-Choice Response Format. This condition conformed to the traditional response format for the NPI such that participants chose between a "narcissistic" and "nonnarcissistic" option for each pair of items. There were 2,754 participants in this condition (28.5% men; seven participants did not report their gender). The majority of the participants were from the United States (n = 1,397); however, sizable portions of the sample also reported being from the United Kingdom (n = 220), India (n = 197), Canada (n = 144), and Australia (n = 111). In terms of education, sizable portions of the sample completed college (15.8%), completed a graduate degree (16.6%), were currently in college (29.7%), or completed some college (14.1%). Participants' ages ranged from 18 to 65 years (M = 29.01, SD = 11.12).

Single-Stimulus Dichotomous Response Format. In this condition, participants were asked to respond to each NPI item option separately using a dichotomous response format of "true" or "false." There were 2,275 participants in this condition (27.8% men; eight participants did not report their gender). The majority were from the United States (n = 1,210); sizable portions also reported being from the United Kingdom (n = 218), India (n = 139), and Canada (n = 158). In terms of education, sizable portions of the sample completed college (15.1%), completed a graduate degree (n = 15.9), were currently in college (29.8%), or completed some college (15.9%). Participants' ages ranged from 18 to 65 years (M = 29.79, SD = 11.67).

Single-Stimulus Rating Scale Response Format. In this condition, participants were asked to respond to each NPI item option separately using a Likert-type scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). There were 2,156 participants in this condition (29.7% men; four participants did not report their gender). The majority were from the United States (n = 1,171); however, sizable portions also reported being from the United Kingdom (n = 177), India (n = 119), and Canada (n = 119). Sizable portions of the sample completed college (15.9%), completed a graduate degree (16.6%), were currently in college (29.2%), or completed some college (13.9%). Participants' ages ranged from 18 to 65 years (M = 30.07, SD = 11.52).

Results

Table 3 presents descriptive item-level statistics across the three different response formats. For the forced-choice condition, we provide the proportion of participants who endorsed each response option. For the single-stimulus dichotomous condition, we provide the proportion of participants who selected *true* for each response option. We also present the phi correlation coefficient between participants' responses to the two statements that are coupled together in the standard NPI presentation. For example, Table 3 shows that participants' responses to Option A for Item 1 were strongly negatively correlated with their responses for Option B for Item 1 ($r = -.51$). For the single-stimulus rating scale condition, we provide the means and standard deviations for both response options, as well as the Pearson correlation coefficient between participants' responses to the two items that are presented as paired options in the original NPI forced-choice format. For instance, Table 3 shows that participants' responses to Option A for Item 1 were strongly negatively correlated with their responses for Option B for Item 1 ($r = -.57$).

Do the NPI Item Pairs Reflect Unidimensional or Multidimensional Couplets?

We used the correlation between the two response options to determine whether some item pairs from the forced-choice NPI are multidimensional rather than unidimensional.(see Table 3).[3] In their influential article on scale development, Clark and Watson (1995) stated,

> If one is measuring a broad higher order construct such as extraversion, a mean correlation [between the scale items] as low as .15-.20 probably is desirable; by contrast, for a valid measure of a narrower construct such as talkativeness, a much higher mean intercorrelation (perhaps in the .40-.50 range) is needed. (p. 316)

We believe that many of the constructs assessed by the NPI (e.g., entitlement) are likely to possess a level of bandwidth somewhere between Extraversion and Talkativeness. We therefore considered Pearson correlations less than or equal to |.30| to be suggestive of the possibility that the two response options represent two different traits.

Using this criterion, 19 item pairs on the NPI 40 demonstrated such low correlations (i.e., pairs for items 3, 4, 6, 9, 12, 14, 18, 24, 25, 27, 31, 32, 34, 35, 36, 37, 38, 39, and 40). Of note, a majority of the items from the Raskin and Terry (1988) Entitlement (five out of six items) and Superiority (four out of five items) scales were included in this list (similarly, three out of the four items making up the Entitlement/Exploitativeness subscale of the Ackerman et al. [2011] solution were included). In contrast, item pairs with the strongest correlations belonged to the Raskin and Terry (1988) Vanity (none of the three items from the scale were included in our list of 19 multidimensional item pairs), Exhibitionism (two out of the seven items were included in our list), and Authority (three out

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Table 3. Descriptive Statistics for Narcissistic Personality Inventory Items Across the Response Formats.

	Forced-choice		Single-stimulus dichotomous			Single-stimulus rating scale				
			Proportion endorsed			Means and standard deviations				
	Proportion endorsed		Option A	Option B		Option A		Option B		
Item	Option A	Option B	True	True	r_{within}	*M*	*SD*	*M*	*SD*	r_{within}
1	0.69	0.31	0.61	0.29	−.51	3.38	0.97	2.50	0.97	−.57
2	0.17	0.83	0.25	0.86	−.23	2.57	0.93	3.75	0.84	−.35
3	0.23	0.77	0.23	0.83	−.16	2.38	1.12	3.66	0.96	−.22
4	0.73	0.27	0.68	0.42	−.08	3.32	1.12	2.98	0.96	−.09
5	0.52	0.48	0.59	0.52	−.30	3.26	1.26	3.21	1.10	−.39
6	0.32	0.68	0.55	0.94	−.04	3.26	1.03	4.15	0.74	.00
7	0.70	0.30	0.59	0.31	−.28	3.13	1.06	2.69	1.11	−.32
8	0.74	0.26	0.87	0.30	−.20	3.97	0.87	2.28	1.06	−.32
9	0.56	0.44	0.76	0.74	−.10	3.42	1.03	3.73	0.99	−.09
10	0.39	0.61	0.47	0.71	−.52	2.78	1.12	3.57	0.96	−.58
11	0.51	0.49	0.60	0.62	−.45	3.37	1.01	3.36	1.07	−.46
12	0.43	0.57	0.43	0.77	−.13	3.03	1.04	3.48	0.99	−.12
13	0.29	0.71	0.37	0.76	−.33	2.77	1.10	3.67	1.05	−.35
14	0.25	0.75	0.51	0.66	.08	3.24	1.07	3.39	0.96	.09
15	0.76	0.24	0.75	0.20	−.64	3.58	1.05	2.36	1.06	−.69
16	0.56	0.44	0.60	0.77	−.20	3.39	1.02	3.53	1.06	−.32
17	0.57	0.43	0.94	0.79	.25	4.14	0.77	3.79	0.93	.37
18	0.64	0.36	0.87	0.76	−.01	4.05	0.96	3.81	1.00	.04
19	0.59	0.41	0.62	0.41	−.41	3.10	1.16	2.87	1.12	−.54
20	0.80	0.20	0.86	0.28	−.37	3.85	0.88	2.56	1.09	−.46
21	0.33	0.67	0.34	0.74	−.50	2.92	1.07	3.41	1.08	−.54
22	0.45	0.55	0.65	0.62	−.42	3.28	1.08	3.31	1.12	−.46
23	0.75	0.25	0.84	0.43	.26	3.73	0.88	3.08	0.89	.42
24	0.28	0.72	0.55	0.91	−.01	3.26	1.05	4.15	0.80	−.02
25	0.29	0.71	0.40	0.89	−.08	2.93	1.14	3.73	0.79	−.07
26	0.35	0.65	0.50	0.81	−.30	2.92	1.11	3.76	0.91	−.35
27	0.40	0.60	0.50	0.74	−.24	3.24	1.12	3.63	1.05	−.27
28	0.69	0.31	0.62	0.31	−.36	3.29	1.14	2.71	1.11	−.40
29	0.54	0.46	0.54	0.45	−.63	3.12	1.15	2.87	1.15	−.70
30	0.37	0.63	0.27	0.56	−.48	2.63	1.11	3.14	1.16	−.60
31	0.47	0.53	0.66	0.84	−.12	3.49	1.12	3.66	1.00	−.22
32	0.61	0.39	0.59	0.44	−.19	3.08	1.03	3.04	0.98	−.24
33	0.47	0.53	0.61	0.61	−.37	3.43	1.06	3.04	1.07	−.45
34	0.47	0.53	0.82	0.94	.12	3.81	0.92	4.32	0.76	.27
35	0.60	0.40	0.91	0.34	.05	3.92	0.77	2.78	1.03	.20
36	0.30	0.70	0.43	0.75	−.18	3.08	1.08	3.61	1.03	−.14
37	0.40	0.60	0.39	0.74	.01	2.93	1.21	3.63	1.05	−.02
38	0.17	0.83	0.17	0.82	−.17	2.21	0.98	3.64	0.97	−.17
39	0.29	0.71	0.61	0.97	−.05	3.44	0.88	4.35	0.72	−.05
40	0.51	0.49	0.46	0.59	−.20	2.72	1.07	3.43	1.03	−.21

of the eight items were included in our list) subscales. Taken together, these results suggest that although the majority of NPI items seem to conform more closely to a unidimensional measurement framework, items related to entitlement and superiority appear to better reflect a multidimensional framework. Given this evidence of multidimensionality among particular forced-choice NPI couplets, it is possible that the factor structure will be notably affected across response formats. We investigate this possibility in the next section.

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Does the Response Format of the NPI Affect its Factor Structure?

A critical consideration in transitioning the NPI from a forced-choice to single-stimulus response format is the generalizability of its factor structure. Our analyses in this section focus on uncovering the factor structure associated with each response format and determining whether similar factors emerge. We begin with a traditional factor analytic approach that aims to identify the optimal number of factors across each of the formats. We subsequently investigate similarities and differences in the factor structure hierarchies across formats as different numbers of factors are extracted. Full results for these and other analyses in this article (along with data sets and other materials) are available at the Open Science Framework (OSF) website: osf.io/y9pg4

Although we could perform factor analyses on the entire set of 80 items for the single-stimulus response formats, we believe that researchers who adopt these formats will likely only use the narcissistic options. Moreover, including both the narcissistic and nonnarcissistic response options in the same factor analysis may make it more difficult to replicate previous factor solutions given that additional dimensions reflecting covariation among the nonnarcissistic response options may emerge. To provide more useful results, we therefore analyzed just the narcissistic options from the single-stimulus response formats.[4]

Optimal Factor Structure of the NPI Across Response Formats. One of the most important decisions in performing a factor analysis is deciding on the number of factors to extract and using a combination of approaches is generally recommended (e.g., Gorsuch, 1983). Accordingly, we used several approaches to inform our decisions: (a) visual inspection of the scree plot based on the eigenvalues (Cattell, 1966), (b) the minimum average partial (MAP) method (Velicer, 1976), (c) parallel analysis (PA; Horn, 1965),[5] (d) the Hull method (Lorenzo-Seva, Timmerman, & Kiers, 2011), and (e) model fit.[6] In the end, we considered the interpretability of the factors to be paramount in the selection of any factor solution.

Forced-choice response format. Our multifaceted factor retention approach suggested the extraction of one-, three-, four-, and seven-factor solutions for the forced-choice response format, with the majority of the approaches favoring a three-factor solution (i.e., the scree plot, MAP test, and PA with minimum rank factor analysis [MRFA] based on the 95th percentile of the random eigenvalues). After generating these solutions using Mplus version 6.11 (Muthén & Muthén, 1998-2010) with weighted least squares mean and variance-adjusted estimation and Geomin rotation, we reasoned that the three-factor solution worked best as it isolated the adaptive content from the more maladaptive content. Moreover, unlike the other solutions, each of the factors was well-defined, relatively distinct from the other factors in terms of content coverage, and substantively meaningful.

Table 4 presents the pattern loadings. As can be seen, Factors I and II appeared to resemble the Leadership/Authority and Grandiose Exhibitionism dimensions from the Ackerman et al. (2011) solution, respectively. The Factor II dimension in Table 4, however, was primarily defined by vanity content. In addition, Factor III in this study did not closely replicate the Ackerman et al. (2011) Entitlement/Exploitativeness dimension. Although all four Entitlement/Exploitativeness items still possessed primary loadings on Factor III, items related to Exhibitionism generally exhibited the strongest loadings.[7] Based on this, we decided to label Factors I, II, and III, as Leadership, Vanity, and Exhibitionism, respectively.

Single-stimulus dichotomous response format for the narcissistic options. The factor retention criteria for the 40 narcissistic options from the single-stimulus dichotomous response format suggested the extraction of three-, five-, six-, and seven-factor solutions; furthermore, most of the criteria favored a three- (i.e., scree plot, MAP test, and PA with MRFA based on 95th percentile of random eigenvalues) or five-factor (i.e., scree plot, PA with MRFA based on mean of random eigenvalues, and model fit) solution. We therefore used Mplus version 6.11 with weighted least squares mean and variance-adjusted estimation and Geomin rotation to generate and inspect solutions that contained three to seven factors.

The three-, six-, and seven-factor solutions contained dimensions that were redundant, ill defined (few items had salient loadings), and/or difficult to interpret substantively. In contrast, the four- and five-factor solutions contained distinct factors that were more easily interpreted. In the end, we chose the five-factor solution given its cleaner differentiation of the adaptive and maladaptive content. Table 5 presents the pattern coefficients for this solution. As can be seen, several dimensions emerged with similar content as the factors from the forced-choice response format condition (i.e., Factors I, IV, and V). Additional dimensions characterized by Manipulativeness (exploitativeness content) and Superiority (a combination of entitlement and superiority content) also appeared. We therefore labeled Factors I through V in this solution as Exhibitionism, Manipulativeness, Superiority, Leadership, and Vanity, respectively.

Single-stimulus rating response format for the narcissistic options. The various factor retention criteria for the 40 narcissistic options from the single-stimulus rating format condition suggested that we extract three-, five-, six-, seven-, and eight-factor solutions, with most suggesting a three-factor solution (i.e., scree plot, MAP test, and PA with

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Table 4. Pattern Coefficients for the Three-Factor Exploratory Factor Analysis Solution of the Forced-Choice Response Format From the Narcissistic Personality Inventory.

		Factor		
Item	Narcissistic response	I	II	III
10	I see myself as a good leader.	**0.85**	−0.02	−0.17
36	I am a born leader.	**0.76**	0.04	−0.01
1	I have a natural talent for influencing people.	**0.67**	−0.05	−0.10
11	I am assertive.	**0.63**	0.02	−0.06
32	People always seem to recognize my authority.	**0.62**	0.01	0.13
33	I would prefer to be a leader.	**0.58**	−0.05	0.22
21	I always know what I am doing.	**0.48**	0.01	0.00
16	I can read people like a book.	**0.45**	0.06	0.02
17	I like to take responsibility for making decisions.	**0.43**	−0.01	−0.03
35	I can make anybody believe anything I want them to.	0.39	−0.05	0.11
34	I am going to be a great person.	0.38	−0.26	−0.19
27	I have a strong will to power.	0.37	−0.18	0.27
23	Everybody likes to hear my stories.	0.35	−0.15	0.05
5	If I ruled the world it would be a much better place.	0.34	−0.08	0.24
40	I am an extraordinary person.	0.30	−0.28	0.05
22	I rarely depend on anyone else to get things done.	0.30	0.07	−0.14
39	I am more capable than other people.	0.29	0.06	0.28
31	I can live my life in any way I want to.	0.23	−0.17	0.02
19	I like to look at my body.	0.01	**−0.83**	−0.26
29	I like to look at myself in the mirror.	−0.14	**−0.76**	−0.04
15	I like to display my body.	−0.06	**−0.68**	−0.06
26	I like to be complimented.	0.04	**−0.58**	−0.01
4	I know that I am good because everybody keeps telling me so.	0.19	**−0.50**	0.00
28	I like to start new fads and fashions.	−0.08	**−0.50**	0.17
9	I think I am a special person.	0.22	−0.38	0.08
37	I wish somebody would someday write my biography.	0.06	−0.33	0.14
8	I will be a success.	0.29	−0.29	0.06
18	I want to amount to something in the eyes of the world.	0.16	−0.21	0.19
7	I like to be the center of attention.	0.03	**−0.50**	**0.54**
30	I really like to be the center of attention.	0.06	**−0.47**	**0.53**
12	I like having authority over people.	**0.40**	0.02	**0.49**
25	I will never be satisfied until I get all that I deserve.	−0.01	−0.18	**0.47**
38	I get upset when people don't notice how I look when I go out in public.	−0.26	**−0.43**	**0.47**
20	I am apt to show off if I get the chance.	−0.08	−0.37	**0.44**
6	I can usually talk my way out of anything.	0.17	0.02	**0.41**
14	I insist upon getting the respect that is due me.	−0.21	−0.16	**0.40**
13	I find it easy to manipulate people.	0.31	0.02	0.39
24	I expect a great deal from other people.	0.04	0.05	0.33
2	Modesty doesn't become me.	−0.05	−0.16	0.32
3	I would do almost anything on a dare.	0.12	−0.15	0.23

Note. Loadings for several items (i.e., Items 4, 5, 7, 9, 10, 15, 17, 18, 19, 20, 22, 23, 26, 28, 32, 35, and 40) were reversed in this table so that they would reflect the loading linked to the endorsement of the narcissistic option. Factor I = Leadership, Factor II = (low Vanity), and Factor III = Exhibitionism. Coefficients at or above |.40| are bolded. Latent factor correlations (these were based on the nonreversed loadings): *r* between Factors I and II = −.45, *r* between Factors I and III = .19, and *r* between Factors II and III = −.23.

MRFA). Mplus version 6.11 was used to carry out exploratory factor analysis on the Pearson correlation matrix of the 40 narcissistic options with maximum likelihood estimation and Geomin rotation. We generated and inspected solutions containing three to eight factors.

We found that the six-, seven-, and eight-factor solutions contained ill-defined factors (e.g., factors with two or less items loading greater than |.40|). In contrast, the three-, four-, and five-factor solutions contained factors that were more or less well-defined and substantively interpretable. As was the

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Table 5. Pattern Coefficients for the Five-Factor Exploratory Factor Analysis Solution of the Narcissistic Options From the Single-Stimulus Dichotomous Response Format of the Narcissistic Personality Inventory.

		Factor				
Item	Narcissistic response	I	II	III	IV	V
30	I really like to be the center of attention.	**.94**	−.01	−.03	.31	−.02
7	I like to be the center of attention.	**.93**	−.05	−.03	.31	.01
20	I am apt to show off if I get the chance.	**.54**	.07	.22	−.02	.05
38	I get upset when people don't notice how I look when I go out in public.	**.51**	.10	.30	−.31	.02
26	I like to be complimented.	**.44**	−.22	.12	.04	.25
28	I like to start new fads and fashions.	.27	.11	.25	.03	.21
22	I rarely depend on anyone else to get things done.	−.19	.13	.11	.07	−.05
35	I can make anybody believe anything I want them to.	.04	**.76**	.19	−.07	−.07
13	I find it easy to manipulate people.	.13	**.74**	−.04	.06	−.07
6	I can usually talk my way out of anything.	.06	**.65**	.02	.12	−.02
1	I have a natural talent for influencing people.	.00	**.63**	−.12	**.43**	.08
16	I can read people like a book.	−.09	**.43**	.09	.07	−.01
3	I would do almost anything on a dare.	.13	.33	.25	−.08	.01
23	Everybody likes to hear my stories.	.01	.32	.15	.24	.13
34	I am going to be a great person.	.01	−.07	**.59**	.07	.34
25	I will never be satisfied until I get all that I deserve.	.26	.04	**.58**	−.14	−.13
40	I am an extraordinary person.	−.11	−.02	**.56**	.13	.35
14	I insist upon getting the respect that is due me.	.21	.01	**.51**	−.03	.01
9	I think I am a special person.	−.01	−.08	**.51**	.08	**.47**
8	I will be a success.	−.06	−.04	**.47**	.29	.34
18	I want to amount to something in the eyes of the world.	.21	−.13	**.44**	−.03	−.06
27	I have a strong will to power.	.10	.15	**.43**	.28	−.03
37	I wish somebody would someday write my biography.	.21	.07	.39	.06	.05
5	If I ruled the world it would be a much better place.	.05	.04	.30	.14	.00
21	I always know what I am doing.	−.11	.17	.30	.18	−.02
31	I can live my life in any way I want to.	−.12	.23	.29	−.08	.13
39	I am more capable than other people.	−.06	.15	.29	.24	.04
24	I expect a great deal from other people.	.17	.02	.26	.10	−.11
4	I know that I am good because everybody keeps telling me so.	.06	.09	.26	.05	.16
2	Modesty doesn't become me.	.14	−.01	.21	−.03	−.03
10	I see myself as a good leader.	.00	.03	.01	**.88**	.10
33	I would prefer to be a leader.	.31	−.06	.02	**.82**	−.10
36	I am a born leader.	.02	.18	.02	**.77**	.08
32	People always seem to recognize my authority.	−.04	.34	.06	**.53**	.02
17	I like to take responsibility for making decisions.	−.02	.05	.14	**.48**	−.04
11	I am assertive.	.00	.18	.02	**.48**	.11
12	I like having authority over people.	.37	.06	.17	**.46**	−.16
19	I like to look at my body.	**.44**	.04	−.02	−.03	**.80**
29	I like to look at myself in the mirror.	**.46**	.04	−.01	−.02	**.71**
15	I like to display my body.	**.50**	.02	.01	−.03	**.54**

Note. Coefficients at or above |.40| are bolded. Factor I = Exhibitionism, Factor II = Manipulativeness, Factor III = Superiority, Factor IV = Leadership, and Factor V = Vanity. Latent factor correlations: *r* between Factors I and II = .30, *r* between Factors I and III = .24, *r* between Factors I and IV = .03, *r* between Factors I and V = −.03, *r* between Factors II and III = .30, *r* between Factors II and IV = .25, *r* between Factors II and V = .09, *r* between Factors III and IV = .45, *r* between Factors III and V = .17, and *r* between Factors IV and V = .23.

case for the single-stimulus dichotomous response format condition, we preferred the five-factor solution given its more refined division of adaptive and maladaptive content. As can be seen in Table 6, the factors in this solution appeared relatively similar to those found for the single-stimulus dichotomous response format, and so we labeled Factors I through V as Manipulativeness, Exhibitionism, Leadership, Vanity, and Superiority, respectively.

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Table 6. Pattern Coefficients for the Five-Factor Exploratory Factor Analysis Solution of the Narcissistic Options From the Single-Stimulus Rating Response Format of the Narcissistic Personality Inventory.

		Factor				
Item	Narcissistic response	I	II	III	IV	V
35	I can make anybody believe anything I want them to.	**.69**	−.01	−.01	.00	.08
13	I find it easy to manipulate people.	**.68**	.04	.00	.03	−.10
6	I can usually talk my way out of anything.	**.64**	.05	.08	.00	−.03
1	I have a natural talent for influencing people.	**.50**	−.01	.31	.01	.01
16	I can read people like a book.	**.41**	−.12	.02	.01	.10
3	I would do almost anything on a dare.	.29	.20	−.01	−.01	.03
23	Everybody likes to hear my stories.	.28	.07	.16	−.04	.16
25	I will never be satisfied until I get all that I deserve.	.23	.21	−.08	.03	.18
2	Modesty doesn't become me.	.16	.08	−.04	.06	−.04
30	I really like to be the center of attention.	−.02	**.87**	.14	−.01	−.02
7	I like to be the center of attention.	.01	**.84**	.14	−.02	−.02
20	I am apt to show off if I get the chance.	.15	**.47**	−.03	.05	.01
38	I get upset when people don't notice how I look when I go out in public.	.09	.37	−.20	.08	.06
26	I like to be complimented.	−.10	.31	−.10	.10	.25
28	I like to start new fads and fashions.	.13	.19	.06	.17	.13
24	I expect a great deal from other people.	.06	.17	.07	−.02	.07
22	I rarely depend on anyone else to get things done.	.13	−.15	.12	−.01	.04
10	I see myself as a good leader.	−.04	.01	**.79**	.02	.05
33	I would prefer to be a leader.	−.05	.17	**.71**	.01	.02
36	I am a born leader.	.11	.02	**.70**	−.01	.03
32	People always seem to recognize my authority.	.26	−.02	**.48**	.02	−.01
11	I am assertive.	.16	−.02	**.47**	.07	−.03
17	I like to take responsibility for making decisions.	−.01	−.01	**.47**	−.01	.06
12	I like having authority over people.	.18	.20	.38	.03	−.01
27	I have a strong will to power.	.18	.04	.38	.02	.09
21	I always know what I am doing.	.20	−.06	.26	.04	.03
19	I like to look at my body.	−.01	−.06	.05	**.91**	.00
29	I like to look at myself in the mirror.	−.03	.04	−.03	**.68**	.13
15	I like to display my body.	.11	.10	.00	**.57**	−.05
34	I am going to be a great person.	−.02	−.03	.04	.00	**.72**
40	I am an extraordinary person.	.04	−.02	.09	.02	**.66**
9	I think I am a special person.	−.03	.02	.02	.07	**.64**
8	I will be a success.	−.01	−.01	.22	.02	**.55**
4	I know that I am good because everybody keeps telling me so.	.10	.09	−.01	−.03	.34
31	I can live my life in any way I want to.	.18	−.03	.01	−.02	.27
18	I want to amount to something in the eyes of the world.	.01	.17	.00	−.02	.27
37	I wish somebody would someday write my biography.	.13	.19	.01	.03	.26
14	I insist upon getting the respect that is due me.	.19	.10	−.04	.01	.25
39	I am more capable than other people.	.18	.01	.17	−.02	.24
5	If I ruled the world it would be a much better place.	.14	−.01	.16	−.02	.21

Note. Coefficients at or above |.40| are bolded. Factor I = Manipulativeness, Factor II = Exhibitionism, Factor III = Leadership, Factor IV = Vanity, and Factor V = Superiority. Latent factor correlations: *r* between Factors I and II = .37, *r* between Factors I and III = .43, and *r* between Factors I and IV = .25, *r* between Factors I and V = .37, *r* between Factors II and III = .22, *r* between Factors II and IV = .41, *r* between Factors II and V = .28, *r* between Factors III and IV = .20, *r* between Factors III and V = .52, and *r* between Factors IV and V = .36.

Replication of factors across response formats. To quantify the replicability of the factors across the response formats, we computed Tucker's congruence coefficients (*k*s) using the formula reported in Lorenzo-Seva and ten Berge (2006, p. 57). Lorenzo-Seva and ten Berge (2006) proposed the following thresholds for judging the degree of factor similarity: $k < .85$ (lack of factor similarity), $k = .85$ to .94 (fair similarity), $k > .95$ (good similarity). Using these criteria, the Leadership factor from the forced-choice response format was fairly similar to the Leadership factors from the

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single-stimulus dichotomous (k = .86) and rating (k = .87) response formats. Similarly, the Leadership factors between the single-stimulus formats were very similar (k = .98).

Although the Exhibitionism factor from the forced-choice format was not similar to the Exhibitionism factors from the single-stimulus dichotomous (k = .65) and rating (k = .74) formats, the Exhibitionism factors from the single-stimulus formats were fairly similar (k = .90). In contrast, each of the Vanity factors across the formats demonstrated poor similarity with one another (ks between the forced-choice format factor and the factors from the single-stimulus dichotomous and rating formats were −.78 and −.71, respectively; k between single-stimulus format factors was .82). Finally, there was fair-to-good similarity between the single-stimulus factors for Superiority (k = .85) and Manipulativeness (k = .96).

Investigating the Hierarchical Structure of the NPI Across Response Formats. To more comprehensively evaluate how the factor structures across formats change as different numbers of factors are extracted, we elected to use the "bass-ackwards" approach advocated by Goldberg (2006). This approach provides additional insight into how the response format for the NPI affects changes in the broader and narrower constructs linked to different factor solutions. It also provides a better understanding of how robust different dimensions are across formats (i.e., both how consistently they emerge and how consistently well-defined they are across different factor solutions).

Traditional "bottom–up" strategies used to discern hierarchical structure begin with more specific dimensions derived from dimensional analyses of individual items and then proceed to extract increasingly more abstract dimensions from the overlap between the "lower order" specific dimensions that came before them. In contrast, the bass-ackwards approach begins with the broadest dimension underlying participants' responses to a set of items and then aims to determine how this more abstract dimension breaks down into more specific dimensions when more dimensions are extracted in subsequent iterations.

To perform the bass-ackwards approach, researchers begin by extracting one dimension from their data set (i.e., Level 1 of the hierarchical structure). They subsequently extract and rotate a series of progressively more complex solutions (e.g., two rotated dimensions for Level 2 of the hierarchical structure, three rotated dimensions for Level 3 of the hierarchical structure). At each level of the hierarchy, researchers must save the corresponding component/factor scores for the dimension or rotated dimensions. Researchers then compute correlations between the component/factor scores of the dimensions connecting two adjoining levels of the hierarchical structure. These correlations provide insight into how the more abstract dimensions at higher levels of the hierarchy are connected to more specific dimensions at lower levels.

The FACTOR program (Lorenzo-Seva & Ferrando, 2006) was used to perform the exploratory factor analyses and to derive the factor score estimates for each set of analyses on the different response options. Because most of our response formats were unlikely to conform to interval or ratio measurement, we extracted our factors using unweighted least squares on the polychoric correlation matrix.[8] Moreover, we used raw varimax rotation to maximize the interpretive simplicity of the hierarchical structures (this approach ensures that the dimensions extracted at the same level are orthogonal to one another; thus, associations between dimensions at different levels represent zero-order correlations).

Figures 1 to 3 present six-level hierarchical structures for the NPI items across the three response formats. Despite the heterogeneity of the formats, there appeared to be a clear stopping point at six factors for each set of analyses (at this point, ill-defined factors tended to emerge). To prevent clutter, only correlations ≥.40 are presented in the figures.

Across the three response formats, five factors consistently emerged: Leadership, Exhibitionism, Vanity, Manipulativeness, and Superiority. The Leadership factor was typically identified early in each hierarchy and was well-defined (i.e., had many items with high loadings). Some items common to this factor across formats were "I see myself as a good leader" (paired with "I am not sure if I would make a good leader" in the forced-choice format) and "I have a natural talent for influencing people" (paired with "I am not good at influencing people" in the forced-choice format). Although Leadership was consistent and unchanging at each level of factor abstraction in the forced-choice format, it was saturated with additional content at earlier levels of the hierarchy in the single-stimulus formats (Vanity and Manipulativeness in the single-stimulus dichotomous and rating response formats, respectively).

The Exhibitionism dimension was also well-defined and identified early on in the hierarchies for the forced-choice and single-stimulus rating response formats. Some items consistently loading on this factor were "I like to be the center of attention" (paired with "I prefer to blend in with the crowd") and "I am apt to show off if I get a chance" (paired with "I try not to be a show off"). In both the forced-choice and single-stimulus rating response formats, the Exhibitionism factor often fused with vanity content earlier in the hierarchies; nevertheless, it typically emerged on its own by the fifth level. In contrast, the Exhibitionism dimension did not independently emerge until the fifth level in the single-stimulus dichotomous condition; it was also very poorly defined at the sixth level in this format.

The Vanity factor emerged early in the forced-choice and single-stimulus dichotomous response formats and possessed a rather consistent set of items, such as "I like to look

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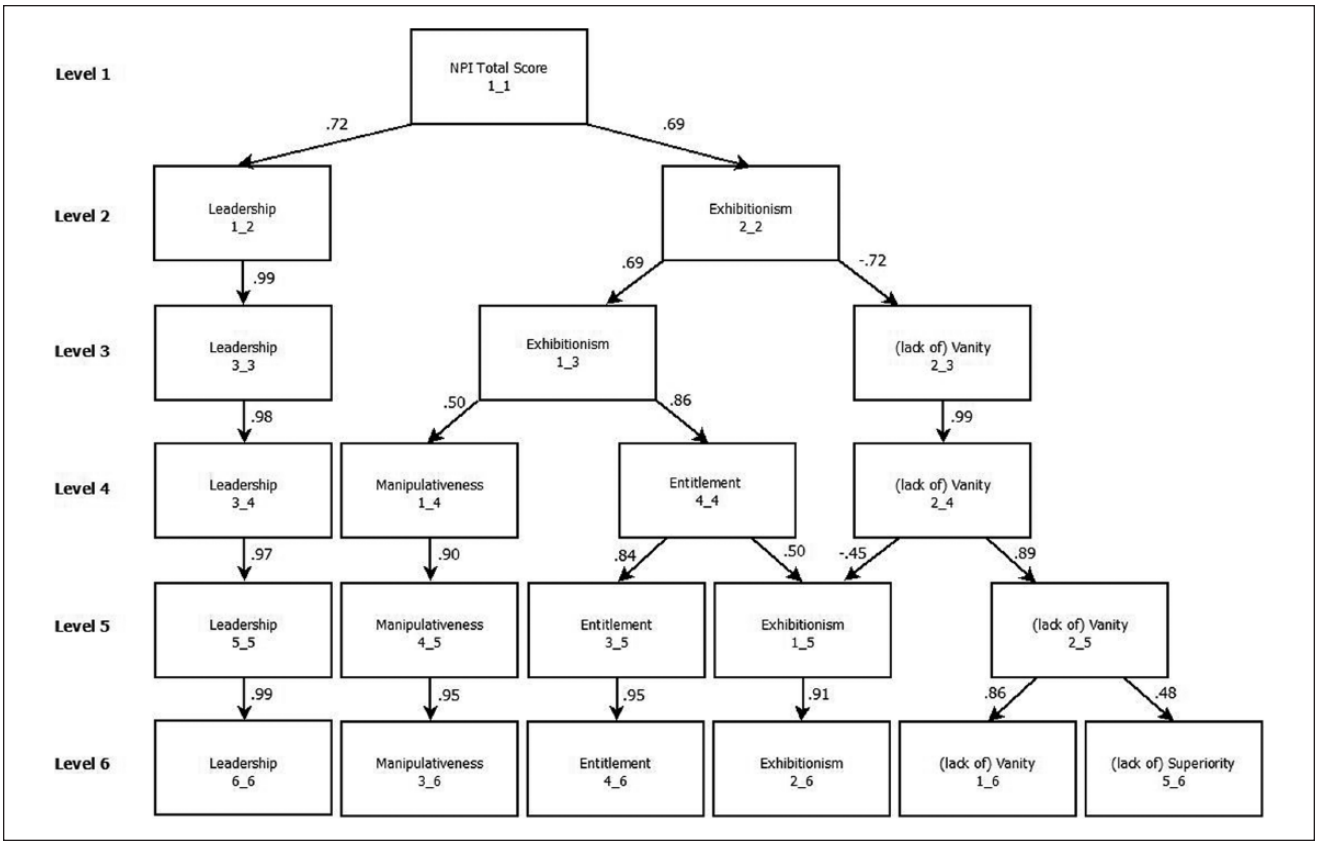

Figure 1. Hierarchical structure for the forced-choice response format of the Narcissistic Personality Inventory.

at my body" (paired with "My body is nothing special") and "I like to look at myself in the mirror" (paired with "I am not particularly interested in looking at myself in the mirror"). The Manipulativeness factor was also robust across response formats, and contained items such as "I can usually talk my way out of anything" (paired with "I try to accept the consequences of my behavior") and "I find it easy to manipulate people" (paired with "I don't like it when I find myself manipulating people"). Within the single-stimulus dichotomous condition, Manipulativeness emerged as a distinct factor early in the hierarchy and remained relatively unchanging throughout. In contrast, Manipulativeness appeared to break off from more abstract factors later in the hierarchy for the other conditions (i.e., breaking off from Exhibitionism and Leadership in the forced-choice and single-stimulus response format conditions, respectively).

The more notable differences in the hierarchies across the formats concerned the emergence of the Superiority and Entitlement factors. With the exception of the single-stimulus rating response format, Superiority did not emerge as a distinct factor until the sixth level of the hierarchies. Moreover, the Superiority factors at this level were not very well-defined. In contrast, the Superiority dimension was better defined in the single-stimulus rating response format (having at least four items with sizable loadings from the third to sixth levels). Common items included "I am going to be a great person" (paired with "I hope I am going to be successful") and "I am an extraordinary person" (paired with "I am much like everybody else").

The Entitlement dimension only emerged as a distinct factor in the forced-choice and single-stimulus rating response formats. Furthermore, the only common item across all solutions was, "I will never be satisfied until I get all that I deserve" (paired with "I take my satisfactions as they come"). Although it was relatively well-defined in the forced-choice format (i.e., having at least four items with sizable loadings in each solution across the hierarchy levels), the loadings for the factor in the single-stimulus rating response format were less than ideal, revealing that there was not enough common variance in these items to clearly demarcate a separate factor.

Discussion

The purpose of this investigation was to further evaluate the psychometric properties of the NPI, the most widely used measure of narcissistic personality traits in social/personality

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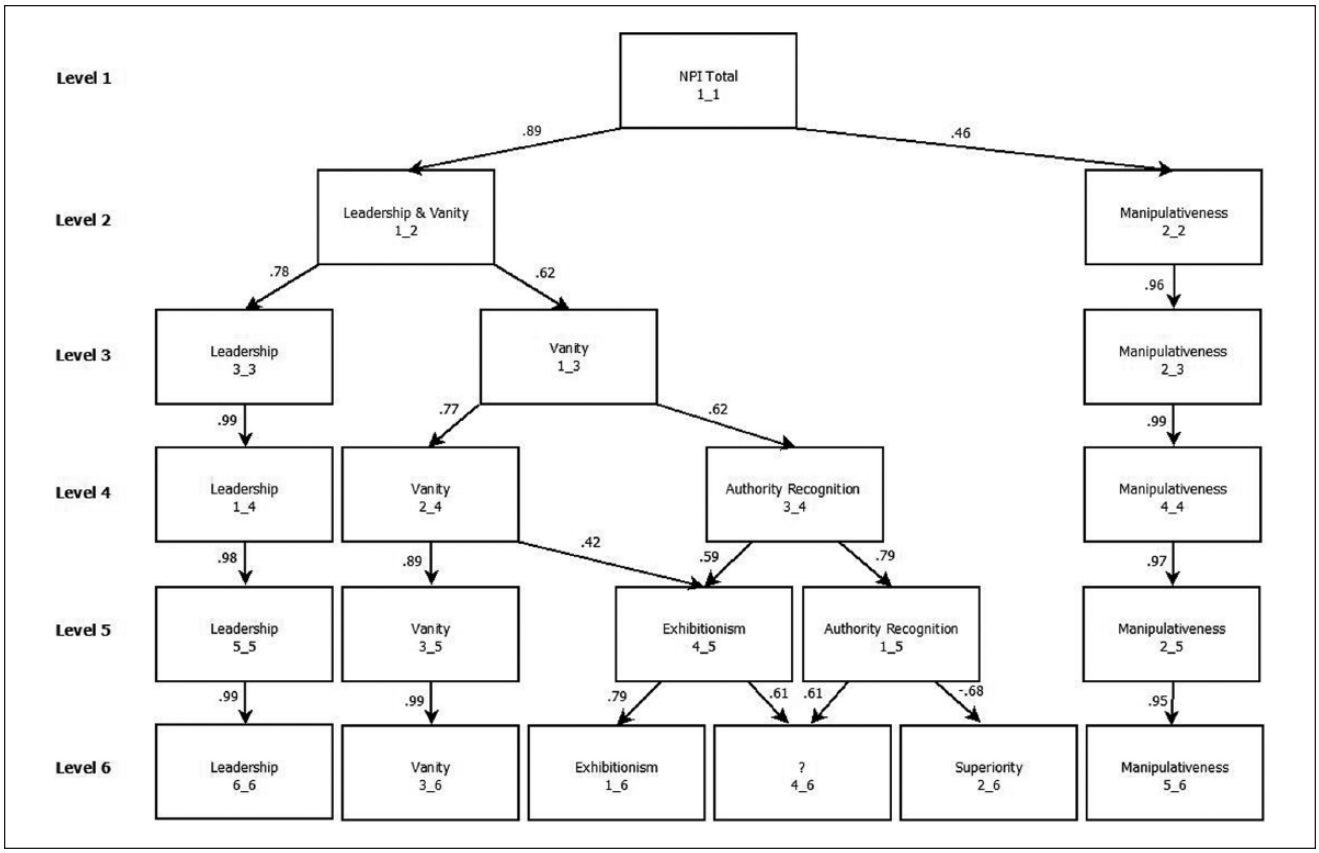

Figure 2. Hierarchical structure for the narcissistic options from the single-stimulus dichotomous response format of the Narcissistic Personality Inventory.

psychology. Specifically, we investigated whether different response formats for the NPI generate differences in the meaning of the responses to the items and how response format affects the factor structure of the inventory. We found that entitlement and superiority items did not appear to possess the same meaning across response formats. We also found that the response format altered the factor structure of the NPI item pool. Although some dimensions translated well across response formats (e.g., Leadership), dimensions that included entitlement and superiority content did not. Below we elaborate on these findings and discuss their implications for the continued use of the NPI.

Do NPI Items Retain Similar Meaning Across Response Formats?

The most widely used version of the NPI consists of 40 pairs of items that require respondents to select the one that is most self-descriptive. Separating the 40 item pairs into 80 different questions may change the meaning of the items and require a different psychological response process. It is important to evaluate whether a switch to a single-stimulus response format alters the psychometric properties of the instrument. In absence of such insights, it would be problematic to assume that previous evidence concerning the NPI's factor structure can be informative regarding how the inventory should be scored under a new response scheme. Likewise, it may be problematic to assume that previous criterion-related validity evidence for particular subscales would be applicable to these same scales in alternative response formats.

Examination of the within-pair correlations revealed that the "narcissistic" and "nonnarcissistic" response options from the Entitlement and Superiority subscales did not correlate very strongly within each couplet. This might mean that the item pairs for these questions (and only these questions) reflect two different traits as opposed to different levels on the same underlying continuums of entitlement and superiority. Individuals using the typical NPI format are essentially picking which trait is more self-diagnostic rather than indicating whether they are relatively high or low on a single trait continuum. For instance, for Item 24, participants choose between an option that seems to reflect entitlement ("I expect a great deal from other people") and one that reflects a prosocial orientation ("I like to do things for other people"). On the other hand, we found that the

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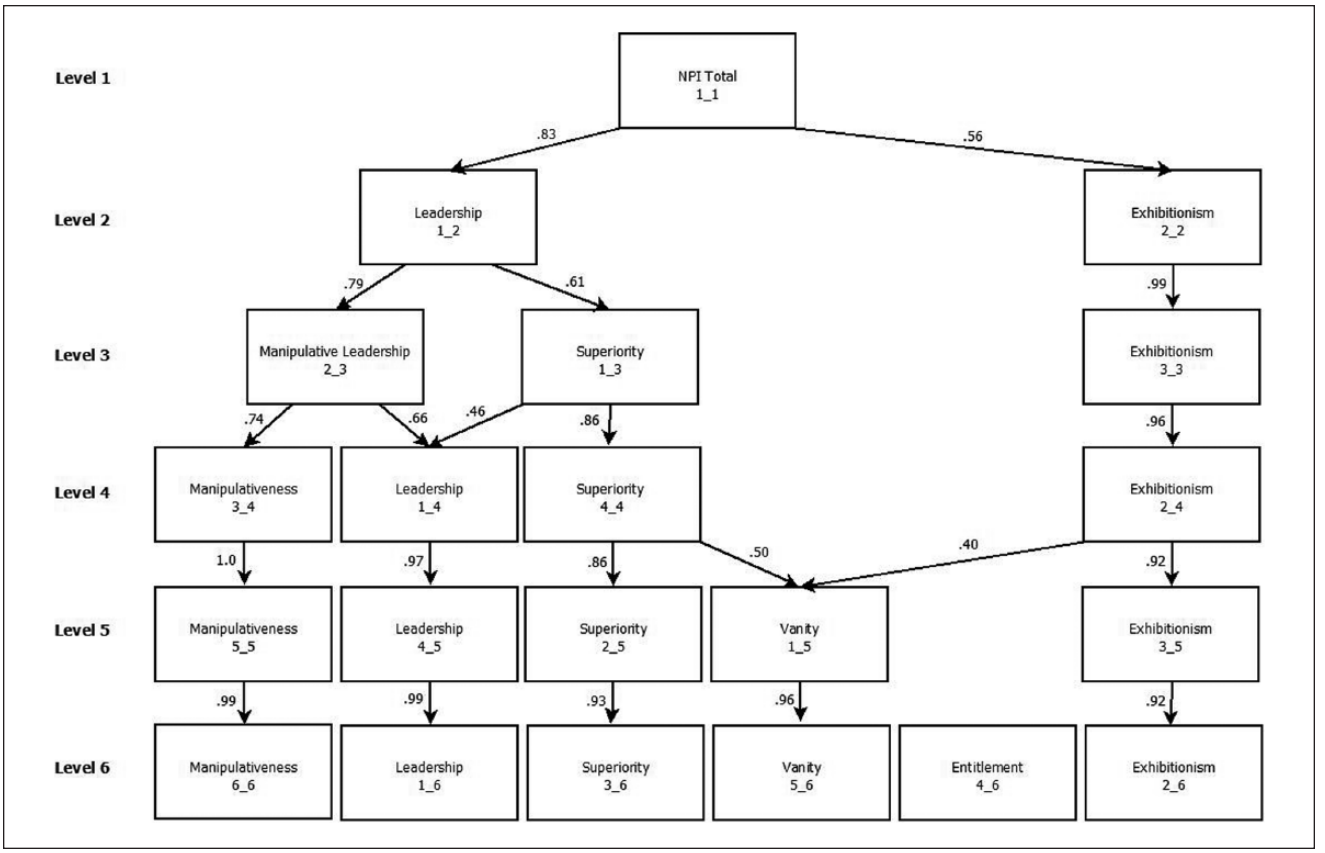

Figure 3. Hierarchical structure for the narcissistic options from the single-stimulus rating response format of the Narcissistic Personality Inventory.

"narcissistic" and "nonnarcissistic" response options for items belonging to the Vanity, Exhibitionism, and Authority subscales were generally moderately to strongly negatively correlated. Thus, it appears that these item pairs reflect a situation in which participants are indicating whether they think they are relatively high or low along a seemingly single dimension.

Does the Factor Structure of the NPI Change Across Response Formats?

An important aim of this research was to evaluate whether the factor structure for the NPI generalizes across response formats. When determining the optimal number of factors, we found that three substantively similar dimensions emerged in the forced-choice and single-stimulus formats: Leadership, Vanity, and Exhibitionism. Moreover, the dimension of Leadership was more or less exchangeable across each of the response formats. Thus, this dimension of personality, assessed by the NPI, tends to emerge regardless of how the items are presented.

Interestingly, the Vanity and Exhibitionism dimensions from the forced-choice format did not replicate in the single-stimulus formats. Inspection of the pattern coefficients in Tables 4 through 6 reveals that many of the items with superiority and entitlement content (which initially loaded on the Vanity and Exhibitionism factors in the forced-choice response format, respectively) came to load on the Superiority factors in the single-stimulus response formats. This suggests that these items may be capturing somewhat different constructs when they are presented without their paired nonnarcissistic options.

Two additional dimensions, Manipulativeness and Superiority, emerged in the single-stimulus response formats. Although Superiority was substantively similar across the formats and contained many similar items with primary loadings, the single-stimulus rating factor was less well-defined, perhaps accounting for the lower level of factor similarity. Manipulativeness, on the other hand, was virtually identical across the single-stimulus response formats. Thus, the choice of true/false or Likert-type scale appears to be of little consequence in the degree of coherence among the items for Manipulativeness.

Investigation of the hierarchical structure of the NPI across formats further bolstered the notion that Leadership is a robust dimension to emerge across response formats

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and factor solutions. Exhibitionism, Vanity, and Manipulativeness were also reasonably robust across response formats and factor solutions. Superiority and Entitlement, on the other hand, were not as robust. Although Superiority consistently emerged across formats, it was ill-defined in the forced-choice and single-stimulus dichotomous response formats. Moreover, Entitlement only emerged in the forced-choice and single-stimulus rating response conditions, and was ill-defined in the single-stimulus rating condition. Taken together, such findings suggest that Superiority and Entitlement may not be as well-measured as other dimensions by the NPI.

Implications

An important question guiding this research was whether the response format of the NPI affects the structural validity of the instrument. If it does, it may not make sense for researchers to simply modify the NPI items into Likert-type scales and use previous factor solutions as guides for scoring the instrument. We found that the factor structure was indeed dependent on the response format provided. Furthermore, the optimal factor structures uncovered did not appear to correspond very well to other factor solutions in the literature. Our findings therefore suggest that it may be inappropriate to use past factor solutions as guides for computing subscales with single-stimulus response formats. We recommend that researchers instead base their derivation of subscales on factor analyses performed with single-stimulus response formats.

With other data being absent, researchers could use our own findings as a guide. To create a scoring scheme, we averaged the pattern loadings across the single-stimulus formats for the same factors and selected items for subscales that possessed averaged loadings >|.40|: Leadership (Items 10, 11, 12, 17, 32, 33, and 36), Exhibitionism (Items 7, 20, 30, and 38), Vanity (Items 15, 19, and 29), Manipulativeness (Items 1, 6, 13, 16, and 35), and Superiority (Items 8, 9, 34, and 40). Although we find it encouraging that similar factors were uncovered across both single-stimulus formats, we must point out that we have no criterion-related validity evidence to bolster our recommendations. Future researchers could, if they desired, accumulate such evidence. However, we believe that it may be more fruitful for researchers to use other single-stimulus instruments for narcissism that have already been well validated (e.g., the Pathological Narcissism Inventory or Narcissistic Admiration and Rivalry Questionnaire).

Besides using the current factor solutions for the single-stimulus formats as guides, researchers could also restrict themselves to translating only those scales that capture the same construct across formats. Unfortunately, we found that researchers could likely only translate the Leadership subscale with little consequence for structural validity and item meaning. Although substantively similar factors for Vanity and Exhibitionism emerged in the single-stimulus formats, closer empirical scrutiny revealed that they did not actually capture similar constructs. Indeed, the superiority and entitlement items connected with these factors in the forced-choice solution appeared to cohere differently when administered as single items. Given that much of their meaning in the forced-choice format is due to their pairings with particular attributes, we believe it would be hasty to transition these subscales into single-stimulus formats until more extensive psychometric work is done to verify their comparability.

Substituting the forced-choice format with a single-stimulus format is not simply a "layout" change; rather, it has important implications for the response process. According to Bornstein (2010), participants responding to self-report items with a Likert-type response scale format initially introspect to assess the general self-relevance of the statement; they subsequently engage in retrospection to selectively recall specific instances relevant to the statement, and then decide whether it is in their best interest to respond honestly or to deliberately present themselves either positively or negatively based on the specifics of the evaluation context. The response process for the multidimensional forced-choice pairs might be distinct in several ways. Rather than assessing the self-relevance of a single statement, the participant must assess the self-relevance of two statements and decide which is more self-descriptive. This involves recalling specific instances of each statement and attempting to decide which statement is more consistent with one's self-views. The situation becomes even more complex when self-presentational concerns are incorporated into the process as the respondent must now decide which statement is more consistent with the image she or he desires to portray.

The fact that the NPI-40 contains a mixture of items that reflect both unidimensional and multidimensional frameworks underscores the argument that it is difficult to give a clear and simple interpretation to the summary score (see Ackerman et al., 2011; Brown et al., 2009; Brown & Tamborski, 2011). In particular, it is unclear whether higher scores on NPI forced-choice items consisting of superiority and/or entitlement reflect more of the "narcissistic" content or less of the "nonnarcissistic" content. Indeed, when item pairs contain options that tap different dimensions, the response does not convey information that has a simple linear relationship to trait level. As a result, this makes it difficult to draw clear conclusions involving interindividual differences.

An important implication of this is that NPI subscales containing entitlement and superiority items might not be suitable for longitudinal research. The issue is that observed mean-level changes in these scales reflect changes in participants' relative preferences for the "narcissistic" attributes

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over the "nonnarcissistic" attributes in their self-descriptions (e.g., a stronger preference for feelings of deservingness over prosocial attitudes). Mean-level differences found in these scales may not necessarily reflect absolute changes in the narcissistic constructs over time. Indeed, they may also reflect absolute changes in the "nonnarcissistic" attributes captured by the opposing options in the item couplets (e.g., declines in prosocial attitudes). Thus, caution is needed when interpreting changes or differences with these scales.

The findings also highlight the potential inadequacy of the NPI for assessing Entitlement and Superiority. Given the multidimensional nature of the items used to assess these facets, we cannot be sure that the NPI assesses these constructs with the comprehensiveness needed for high-quality research. This is especially problematic given the centrality of Entitlement for narcissism among researchers and theorists (Ackerman, Hands, Donnellan, Hopwood, & Witt, n.d.; Brown et al., 2009). If entitlement is a core feature of narcissism, it becomes crucial that widely used measures of narcissism have adequate coverage of this trait domain. Although there is good evidence to suggest that the NPI entitlement scales capture content consistent with the underlying construct (Ackerman et al., 2011), we wonder whether some of the differences observed between such scales and other stand-alone entitlement scales (e.g., Ackerman & Donnellan, 2013) may be due to the ipsative nature of the items. In an effort to better understand the constructs that are being assessed by the entitlement and superiority items, it may be worthwhile to conduct criterion-related validity studies in which the narcissistic and nonnarcissistic response options are separated and used to predict theoretically relevant constructs. In doing so, researchers could gain increased insight into whether the individual options provide the same level of coverage for the constructs.

In the end, the only dimension assessed consistently across response formats was Leadership. Although researchers and clinicians interested in the more adaptive features of narcissism could translate Leadership into a single-stimulus format, those more interested in the maladaptive features of narcissism will likely need to look elsewhere. This naturally begs the question of whether the NPI is worth salvaging. If the only clear dimension to emerge across analyses is Leadership, it may not be worthwhile for researchers interested in other facets to use the measure. After all, the internal consistency coefficients found for the other dimensions of the NPI forced-choice response format are generally poor, and their single-stimulus parallels do not seem to assess the same constructs.

Future Directions and Conclusions

The current work showed that modifying the response format for the NPI may have unintended consequences for the factor structure of the instrument. Although we believe this research provides an important first step toward understanding the impact of response format on the psychometric properties of the NPI, we readily acknowledge that more research is needed. Importantly, future research should investigate whether the response format actually affects the criterion-related validity of the instrument and its subscales as well as its stability. Future work should also investigate whether the response format differentially affects the precision of the measure across different levels of the latent trait. Addressing such questions would go a long way toward clarifying the utility of the forced-choice response format for the NPI.

Brown et al. (2009) expressed reservations about the NPI and stated, "Our understanding of what it means to be narcissistic will surely grow through such discourse, however difficult it might be to offer up such a sacred cow on the altar of scientific progress" (p. 963). We largely agree and offer the following analogy: The NPI is like a first "hand me" down car that has served as a useful mode of transportation during adolescence and young adulthood while also generating a considerable amount of sentimental value. This level of sentiment might engender a desire to preserve the car when it comes time to making decisions about future transportation options. The challenge is to recognize when continued repairs are a losing proposition in terms of the drain on resources and inherent problems with older cars (e.g., increased levels of pollution and poor fuel economy). There is a point when an older car becomes untenable. Indeed, we hope our research can help the field make informed choices about the NPI for future studies.

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Notes

1. We note that some researchers have used the terms "ipsative" and "normative" to describe what we refer to as unidimensional and multidimensional measurement, respectively (see Bartram, 2007). We chose to avoid this terminology, however, given that many researchers associate ipsative and normative with methods of scoring data.
2. Additional analyses investigating the impact of response format on the internal consistency for NPI subscales from common dimensional solutions can be found on the OSF website: osf.io/y9pg4

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3. The similarity in the phi (for the dichotomous response) and Pearson correlations (for the rating response) suggests that the associations between the response options are relatively robust (correlation between column associations = .98).
4. Results for factor analyses conducted on the entire set of 80 narcissistic and nonnarcissistic response options from the single-stimulus response formats (as well as factor analyses on just the 40 nonnarcissistic options) are available on the OSF.
5. Timmerman and Lorenzo-Seva (2011) found that MRFA slightly outperformed Horn's PA with principal components analysis. However, Garrido, Abad, and Ponsoda (2013) recently reported findings from simulation studies in which PA performed on polychoric correlations with a traditional principal components analysis extraction yielded more accurate decisions regarding the correct number of dimensions underlying the data. We therefore examined both in our analyses.
6. Complete details regarding these analyses and a summary of the results can be accessed on the OSF.
7. We also performed confirmatory factor analyses on these data for the forced-choice format and specified factor structures that corresponded to solutions obtained by Ackerman et al. (2011), Corry, Merritt, Mrug, and Pamp (2008), Emmons (1984, 1987), and Raskin and Terry (1988). We found that model fit statistics for these solutions, including Ackerman et al. (2011), were comparable to those found in previous work. Full results are available on the OSF.
8. We attempted to use MRFA on the Pearson correlation matrix for the single-stimulus rating response format, but the program did not converge to a solution.

References

Ackerman, R. A., & Donnellan, M. B. (2013). Evaluating self-report measures of narcissistic entitlement. *Journal of Psychopathology and Behavioral Assessment*, *35*, 460-474.

Ackerman, R. A., Hands, A. J., Donnellan, M. B., Hopwood, C. J., & Witt, E. A. (n.d.). *Investigating experts' views regarding the conceptualization and measurement of narcissism*. Manuscript submitted for publication.

Ackerman, R. A., Witt, E. A., Donnellan, M. B., Trzesniewski, K. H., Robins, R. W., & Kashy, D. A. (2011). What does the Narcissistic Personality Inventory really measure? *Assessment*, *18*, 67-87.

Back, M. D., Kufner, A. C. P., Dufner, M., Gerlach, T. M., Rauthmann, J. F., & Denissen, J. J. A. (2013). Narcissistic admiration and rivalry: Disentangling the bright and dark sides of narcissism. *Journal of Personality and Social Psychology*, *105*, 1013-1037.

Barnett, T., & Lanier, P. A. (1995). Comparison of alternative response formats for an abbreviated version of Rotter's Locus of Control Scale. *Psychological Reports*, *77*, 259-264.

Bartram, D. (2007). Increasing validity with forced-choice criterion measurement formats. *International Journal of Selection and Assessment*, *15*, 263-272.

Bornstein, R. F. (2010). Psychoanalytic theory as a unifying framework for 21st century personality assessment. *Psychoanalytic Psychology*, *27*, 133-152.

Brown, R. P., Budzek, K., & Tamborski, M. (2009). On the meaning and measure of narcissism. *Personality and Social Psychology Bulletin*, *35*, 951-964.

Brown, R. P., & Tamborski, M. (2011). Of tails and their dogs: A critical view of the measurement of trait narcissism in social-personality research. In W. K. Campbell & J. D. Miller (Eds.), *The handbook of narcissism and narcissistic personality disorder: Theoretical approaches, empirical findings, and treatments* (pp. 141-145). Hoboken, NJ: Wiley.

Cain, N. M., Pincus, A. L., & Ansell, E. B. (2008). Narcissism at the crossroads: Phenotypic description of pathological narcissism across clinical theory, social/personality psychology, and psychiatric diagnosis. *Clinical Psychology Review*, *28*, 638-656.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, *1*, 140-161.

Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment*, *7*, 309-319.

Corry, N., Merritt, R. D., Mrug, S., & Pamp, B. (2008). The factor structure of the Narcissistic Personality Inventory. *Journal of Personality Assessment*, *90*, 593-600.

del Rosario, P. M., & White, R. M. (2005). The Narcissistic Personality Inventory: Test-retest stability and internal consistency. *Personality and Individual Differences*, *39*, 1075-1081.

Emmons, R. A. (1984). Factor analysis and construct validity of the Narcissistic Personality Inventory. *Journal of Personality Assessment*, *48*, 291-300.

Emmons, R. A. (1987). Narcissism: Theory and measurement. *Journal of Personality and Social Psychology*, *52*, 11-17.

Garrido, L. E., Abad, F. J., & Ponsoda, V. (2013). A new look at Horn's parallel analysis with ordinal variables. *Psychological Methods*, *18*, 454-474.

Gerbasi, M. E., & Prentice, D. A. (2013). The self- and other-interest inventory. *Journal of Personality and Social Psychology*, *105*, 495-514.

Goldberg, L. R. (2006). Doing it all bass-ackwards: The development of hierarchical factor structures from the top down. *Journal of Research in Personality*, *40*, 347-358.

Gorsuch, R. L. (1983). *Factor analysis* (2nd ed.). Hillsdale, NJ: Erlbaum.

Gray, J. M., & Wilson, M. A. (2007). A detailed analysis of the reliability and validity of the sensation seeking scale in a UK sample. *Personality and Individual Differences*, *42*, 641-651.

Hicks, L. E. (1970). Some properties of ipsative, normative, and forced-choice normative measures. *Psychological Bulletin*, *74*, 167-184.

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, *30*, 179-185.

Lee, S. Y., Gregg, A. P., & Park, S. H. (2013). The person in the purchase: Narcissistic consumers prefer products that positively distinguish them. *Journal of Personality and Social Psychology*, *105*, 335-352.

Lorenzo-Seva, U., & Ferrando, P. J. (2006). FACTOR: A computer program to fit the exploratory factor analysis model. *Behavioral Research Methods*, *38*, 88-91.

Lorenzo-Seva, U., & ten Berge, J. M. F. (2006). Tucker's congruence coefficient as a meaningful index of factor similarity. *Methodology*, *2*, 57-64.

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Lorenzo-Seva, U., Timmerman, M. E., & Kiers, H. A. L. (2011). The Hull method for selecting the number of common factors. *Multivariate Behavioral Research*, *46*, 340-364.

Muthén, L. K., & Muthén, B. O. (1998-2010). *Mplus user's guide* (6th ed.). Los Angeles, CA: Muthén & Muthén.

Pincus, A. L., Ansell, E. B., Pimentel, C. A., Cain, N. M., Wright, A. G. C., & Levy, K. N. (2009). Initial construction and validation of the Pathological Narcissism Inventory. *Psychological Assessment*, *21*, 365-379.

Pincus, A. L., & Lukowitsky, M. R. (2010). Pathological narcissism and narcissistic personality disorder. *Annual Review of Clinical Psychology*, *6*, 421-446.

Raskin, R. N., & Hall, C. S. (1979). A Narcissistic Personality Inventory. *Psychological Reports*, *45*, 590.

Raskin, R. N., & Terry, H. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology*, *54*, 890-902.

Timmerman, M. E., & Lorenzo-Seva, U. (2011). Dimensionality assessment of ordered polytomous items with parallel analysis. *Psychological Methods*, *16*, 209-220.

Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika*, *41*, 321-327.

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