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PROCRASTINATION, CONSCIENTIOUSNESS, ANXIETY, AND GOALS: EXPLORING THE MEASUREMENT AND CORRELATES OF PROCRASTINATION AMONG SCHOOL-AGED CHILDREN

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Abstract: We explore the reliability and validity of a self-report measure of procrastination and conscientiousness designed for use with third- to fifth-grade students. The responses of 120 students are compared with teacher and parent ratings of the student. Confirmatory and exploratory factor analyses were also used to examine the structure of the scale. Procrastination and conscientiousness are highly correlated (inversely); evidence suggests that procrastination and conscientiousness are aspects of the same construct. Procrastination and conscientiousness are correlated with the Physiological Anxiety subscale of the Revised Children's Manifest Anxiety Scale, and with the Task (Mastery) and Avoidance (Task Aversiveness) subscales of Skaalvik's (1997) Goal Orientation Scales. Both theoretical implications and implications for interventions are discussed.

Procrastination has been identified as a substantial hindrance to academic success. In college students, academic procrastination is associated with lower grades and course withdrawals, delay in studying, and delay in completing self-paced coursework (e.g., Beswick, Rothblum, & Mann, 1988; Lay & Burns, 1991; Rothblum, Solomon, & Murakami, 1986). Since 1984 (e.g., Solomon & Rothblum, 1984), a considerable body of research has examined the correlates of chronic or trait procrastination among college students and adults. Using one of at least seven existing procrastination scales, researchers have shown correlations of trait procrastination with self-confidence, self-control, perfectionism, self-consciousness, self-deception, dysfunctional impulsivity, depression, low self-esteem, and low competitiveness, for example (cf., Beswick et al., 1988; Ferrari, Johnson, & McCown, 1995; Flett, Blankenstein, & Martin, 1995; Flett, Hewitt, & Martin, 1995; Lay, 1995; Lay, Edwards, Parker, & Endler, 1989).

The study of procrastination among school-aged children, however, has been hindered by the lack of an effective measure of procrastination for this population. Recently, Lay, Kovacs, and Danto (1998) developed a 12-item scale for this purpose. They defined procrastination as "the tendency to put off that which is necessary to reach some goal" (p. 189), and developed scale items based on Lay's (1986) adult procrastination measure. Lay et al. (1998) also included items to measure conscientiousness: "socially prescribed impulse control that facilitates task- and goaldirected behavior, such as thinking before acting, delaying gratification, following norms and rules, and planning, organizing, and prioritizing tasks" (John & Srivastava, 1999, p. 121). These items were based on the six facets of conscientiousness (competence, order, dutifulness, achievementstriving,

self-discipline, and deliberation) as represented in the Revised NEO Personality Inventory (Costa & McCrae, 1992). Four additional conscientiousness items were adapted from the Big Five Scale for the California Q-Sort (John, Caspi, Robins, Moffitt, & Stouthamer-Loeber, 1994), yielding a 26-item conscientiousness scale. In adults, conscientiousness consistently correlates very highly with procrastination.

Lay et al. (1998) administered the Procrastination and Conscientiousness Scale to 280 Canadian children in Grades 3 to 5. The children's teachers also rated their students on a single-item measure of procrastination, and on six items representing the six facets of conscientiousness. Both the conscientiousness ($\alpha = .86$) and procrastination ($\alpha = .84$) scores were internally consistent. Replicating the results of research with adults (Johnson & Bloom, 1995; Lay, 1997; Schouwenburg & Lay, 1995), there was a high negative correlation ($r = .79$) between procrastination and conscientiousness on the student self-report scales, providing evidence of the construct validity of the scale. Further evidence of validity came from moderate correlations ($r = .27$ for procrastination; $r = .33$ for conscientiousness) between self-report ratings and teacher ratings of procrastination and conscientiousness. These latter correlations may underestimate the validity of the measure. Evidence suggests a generally low correspondence between teacher ratings and children's self-reports (Ledingham, Younger, Schwartzman, & Bergeron, 1982); moreover, while the Procrastination and Conscientiousness Scales include items representing both home and school domains, teachers could only be expected to be familiar with the students in the school setting. Comparison of the student's self-reports to ratings by parents may also be necessary for an adequate validity assessment; however, correlations between parent and student self-report ratings must also be considered through the lens of findings regarding a low correspondence in that domain (Schneider & Byrne, 1989).

Further Exploration of Procrastination in Children

The first goal of the current research is to further examine the reliability and validity of Lay's Procrastination and Conscientiousness Scales. Psychometric assessment is complicated by what could be called the "fundamental problem of psychometrics": the need to determine if a measure correlates with the unobservable construct it is meant to measure. The validity of a measuring device can only be determined with the development of a "nomological network' of validity-supporting relations" (John & Benet-Martinez, 2000, p. 353). The current study adds to the nomological network begun by Lay et al. (1998). This process also allows us to pursue a second goal of our research: To examine the correlations of procrastination and conscientiousness with other constructs as a means of gaining insight into the development of procrastination and the ways in which it impacts student performance in the classroom.

Procrastination, conscientiousness, and anxiety. It is commonly assumed that anxiety is a dominant cause of procrastination. However, the relationship between these

constructs is not straightforward. Some research has found that procrastination did correlate (in adults) with dispositional anxiety and with a related dimension from the Five-Factor Model of personality: neuroticism (e.g., Aitken, 1982; McCown, Petzel, & Rupert, 1987; Rothblum et al., 1986; Scher, Ferrari, & Nelson, 2002; Schouwenburg, 1995). Other researchers, however, found that the relationship between procrastination and anxiety may be accounted for by other factors (e.g., Lay, 1995). In the current research, we explored whether procrastination and conscientiousness may be correlated with some aspects of anxiety but not with others. We used the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985), which has three factor-analytically derived subscales. The Physiological Anxiety Subscale measures physical signs of anxiety, the Worry/Oversensitivity Subscale measures worry or fear (negative affect) about environmental threats, and the Social Concerns/Concentration Subscale measures concerns about the inadequacy of the self in social situations and a lack of an ability to concentrate.

Procrastination and achievement goals. We also included the Goal Orientation Scale (GOS; Skaalvik, 1997), a measure of achievement goal orientation. Research has shown that the goal a student pursues in an achievement context affects both the outcomes of the achievement situation (e.g., how much is learned, performance on the task), as well as emotional reactions to the material (see Urdan, 1997, for a review). Individuals are said to be dispositionally oriented toward some goals more than others. Task (mastery)-oriented individuals are most motivated by a desire to develop one's skills and improve one's abilities; avoidance-oriented individuals are motivated most by the avoidance of unpleasant and effortful tasks. Ego-oriented individuals are motivated by a desire to achieve a fixed level of performance or to otherwise meet certain (usually externally imposed) standards. Ego orientations exist in both an approach (self-enhancing) version and an avoidance (self-defeating) version (cf., Elliot, 1997).

Scher, Nelson, and Osterman (2000) showed that chronic procrastination correlated with task and avoidance orientations (in college students). Although there were some significant correlations between procrastination and the ego-based orientations, these were considerably smaller in magnitude. Scher, Ferrari, & Nelson (2002) showed that people complete a greater percentage of tasks that create mastery. Based on these findings, we tentatively hypothesize that procrastination and conscientiousness will correlate with goal orientations related to qualities of the task (i.e., task and avoidance orientations), but that correlations between procrastination/conscientiousness and the ego-based orientations will be smaller or nonexistent.

Method

Participants

Parental consent forms and parent questionnaires were sent home with all students

in the third, fourth, and fifth grades at two elementary schools in a small midwestern city. The 120 students (32 in Grade 3, 40 in Grade 4, and 48 in Grade 5) who returned signed consent forms and completed parent questionnaires participated in the study (72.3% response rate). Students participating ranged in age from 9 to 12. Over half (57.5%) of the participants were girls.

Data on participant race and socioeconomic status were not collected from the students. The 2000 census for the county in which the data were collected (Coles County, 2001) indicates that the population was 95.4% White, 2.3% African American, 0.8% Asian, and 0.2% Native American or Alaskan Native. The Hispanic population (of any race) was 1.4%. The 1999 median income for the city was \$31,960 (Charleston Area Chamber of Commerce, 2000); a 1997 model-based estimate showed that 18.8% of the children in the county were below the federal poverty level (Coles County, 2001).

Procedure

Student testing session. Students were tested in groups ranging in size from 10 to 40. Students completed the Procrastination and Conscientiousness measure, the RCMAS, and the GOS (see below for details on these scales). The researcher orally presented the instructions for each questionnaire, and was present to answer any questions. In addition, the GOS and the Procrastination/ Conscientiousness measure had sample items with extraneous content that provided the students an opportunity to familiarize themselves with the format. Most of the students completed the three scales in 30 to 40 minutes.

Teacher and parent testing. Each teacher completed a 7-item questionnaire (see below for details) for each participating student in their class. A similar parental questionnaire (with wording changed to reflect the different relationship with the student) was sent home with the parental consent form and a short letter explaining the study. The parent questionnaires were returned with signed parental consent forms.

Student Measures

Conscientiousness and procrastination measure. The Conscientiousness and Procrastination measure was adopted from Lay et al. (1998). Table 1 provides the content of all items. The response format was modeled on Harter's (1982) Perceived Competence Scale for Children. Respondents are asked to first identify which of two opposite statements most closely describes him or her. Then, the child is asked to decide whether this statement is "Really Like Me" or is "Kind of Like Me." This yields a 4-point scale on each item.

Revised Children's Manifest Anxiety Scale. The RCMAS (Reynolds & Richmond, 1985)

is a 37-item self-report measure of manifest anxiety. The RCMAS provides a total anxiety score, a lie subscale, and three factor-analytically derived anxiety subscales: Physiological Anxiety (10 items), Worry/Oversensitivity (11 items), and Social Concerns/Concentration (7 items). Students report whether each statement applies to them on a dichotomous ("Yes"/"No") scale. T scores, based on age and gender norms, are reported for all the scales of the RCMAS. Gerard and Reynolds (1999) summarized the evidence for the validity and reliability of this scale, including factor analyses validating the structure of the scale across a range of subsamples, and research showing that the scale correlates with measures of trait anxiety, but not with measures of state anxiety. Coefficient alpha reliability estimates for the total anxiety scale generally fall in the .80 range; subscale alphas are in the .60 to .70 range (Physiological Anxiety and Social Concerns/ Concentration) or in the .70 to .80 range (Worry/Oversensitivity and Lie Scale).

Goal Orientation Scale. The GOS was developed by Skaalvik (1997) to measure the dispositional tendency to orient toward one of four achievement goals. The Task Orientation Scale measures a tendency to approach tasks that provide mastery (6 items; e.g., "It is important for me to learn new things in school"; "I like to work hard at solving the problems we do in school"). The Avoidance Orientation Scale measures a tendency to avoid tasks which are difficult or require a lot of effort (4 items; e.g., "I like school the best when there is no hard work"; "At school I hope that we do not get any homework"). The Self-Enhancing Orientation Scale measures a tendency to approach situations that provide an opportunity to show that one is smarter or otherwise superior to others (5 items; e.g., "I answer questions in class to show that I know more than the other students"; "I feel successful when I do better than the other kids in school"). The Self-Defeating Orientation Scale measures a tendency to avoid situations where one may appear stupid or where one may be negatively judged by others (7 items; e.g., "At school I worry about making a fool of myself"; "When I am working on the blackboard I worry about what my classmates think about me"). Skaalvik (1997) demonstrated the validity of his scale with exploratory and confirmatory factor analyses of responses. He reported alpha reliability estimates of .81 for Task Orientation, .93 for Avoidance Orientation, .89 for Self-Enhancing Orientation, and .86 for Self-Defeating Orientation. The GOS was originally developed for use in Norway. The items used in the current study were modified slightly from the translation to English presented by Skaalvik (1997) to simplify the language and make it more understandable for a younger age group. Responses to each item were made on 4-point scales labeled "True," "Mostly True," "Mostly False," and "False."

Teacher and Parent Measures

Both teachers and parents completed a 7-item questionnaire about each child. Each item included a 4-point rating scale ("very true of the student [my child]," "mostly true of the student [my child]," "a little true of the student [my child]," "not at all true of the student [my child]"). One item asked for ratings of procrastination ("The

Table 1
Items of the Conscientiousness and Procrastination Measures

Conscientiousness Scale	Item
Deliberation Subscale	
1. (R) Some kids walk through the whole store before they choose a toy or game they would like	BUT Other kids choose the first toy or game that they see
22. Some kids do things first and think about it later	BUT Other kids think first before they do things
26. (R) Some kids read the questions on a test carefully before they begin to answer	BUT Other kids do not read the questions on a test carefully before they begin to answer
28. (R) Some kids choose what they want to wear the night before	BUT Other kids just put on the first thing they find in the morning
37. (R) Some kids think before they put up their hand to answer a question	BUT Other kids just put up their hand even before they have an answer
Competence Subscale	
3. Some kids feel that they cannot do many things well	BUT Other kids feel that they can do many things well
9. (R) Some kids almost always do a good job	BUT Other kids don't always do a good job
24. (R) Some kids always make good choices	BUT Other kids don't always make good choices
31. (R) Some kids know how to act in any place	BUT Other kids do not know how to act in a lot of places
Order Subscale	
4. (R) Some kids like to keep their things neat	BUT Other kids keep their things messy
21. Some kids always lose their things	BUT Other kids never lose their things
30. (R) Some kids always know where they put their things	BUT Other kids are always looking for their things
33. Some kids do not always do neat work	BUT Other kids always do neat work
Achievement-Striving Subscale	
6. (R) Some kids almost always try to do their best	BUT Other kids don't always try to do their best
12. Some kids don't care if they finish their work	BUT Other kids do care if they finish their work
16. Some kids don't always feel like trying to do a good job	BUT Other kids always feel like trying to do a good job
19. (R) Some kids always need to do their best	BUT Other kids don't always need to do their best
23. Some kids like to waste time	BUT Other kids never waste time

Self-Discipline Subscale

- | | |
|---|---|
| 8. (R) Some kids always finish what they start | |
| 13. (R) Some kids always finish everything they have to before they go to sleep | BUT Other kids don't finish what they start |
| 25. Some kids have a hard time doing the things they should | BUT Other kids seldom finish what they have to do before they go to sleep |
| 35. Some kids give up if something is too hard and start something new | BUT Other kids always do what they should |
| | BUT Other kids keep trying even if something is really hard |
- #### Dutifulness Subscale
- | | |
|---|--|
| 14. (R) Some kids almost always keep their promises | BUT Other kids don't always keep their promises |
| 11. (R) Some kids are good listeners | BUT Other kids aren't good listeners |
| 29. Some kids who are just a little sick will try to miss school | BUT Other kids have to be really sick to miss school |
| 38. (R) Some kids always take privileges like being a special helper very seriously | BUT Other kids don't always take privileges like being a special helper very seriously |

Procrastination

- | | |
|--|---|
| 2. Some kids do their homework as soon as they can | BUT Other kids do their homework at the last minute |
| 5. (R) Some kids almost always get out of bed late | BUT Other kids almost always get out of bed on time |
| 7. Some kids always clean their room when they are supposed to | BUT Other kids never clean their room when they are supposed to |
| 10. (R) Some kids waste time before they do their classwork | BUT Other kids do their classwork right away |
| 15. Some kids tell their parents right away about special events at school | BUT Other kids tell their parents at the last minute about special events at school |
| 17. (R) Some kids almost always finish their work at the last minute | BUT Other kids almost always finish their work before they have to |
| 18. Some kids are almost always ready on time | BUT Other kids are almost never ready on time |
| 20. Some kids like to do things they find hard right away | BUT Other kids like to leave things they find hard for later |
| 27. Some kids almost always get to school before the bell rings | BUT Other kids almost always get to school after the bell rings |
| 32. Some kids do everything right away | BUT Other kids wait until later |
| 34. Some kids start doing classwork right away | BUT Other kids wait before they start doing their classwork |
| 36. (R) Some kids waste time doing other things when they have something to finish | BUT Other kids never waste time doing other things when they have something to finish |

Note: Items marked with an (R) should be reverse scored. For the conscientiousness scale, the items are chosen to represent the facets of conscientiousness proposed by Costa and McCrae (1992). The procrastination measure does not have facets.

student [my child] procrastinates (puts off doing things)"). Six items asked about the six facets of conscientiousness ("The student [my child] . . . "is efficient and self-confident," "is organized and methodical," "is dependable and responsible," "is ambitious and determined," "will work on necessary things despite boredom or distraction," "thinks before acting").

Reliability of the Childhood Conscientiousness and Procrastination Measure

Internal consistency reliability estimates were: Procrastination, $\alpha=.73$; Conscientiousness, $\alpha=.74$. Consistent with Lay, Kovacs, and Danto's (1998) findings, reliability estimates for the specific conscientiousness facet subscales were rather low (Competence: $\alpha=.32$; Order: $\alpha=.46$; Achievement-Striving: $\alpha=.38$; Self-Discipline: $\alpha=.21$; Deliberation: $\alpha=.24$; Dutifulness: $\alpha=.37$).

Validity of the Childhood Conscientiousness and Procrastination Measure

Table 2 presents the correlations among the self-report, parent, and teacher ratings of conscientiousness and procrastination in the form of a multitrait/multimethod (MTMM) matrix. Confirmatory factor analysis (CFA) is generally regarded as the appropriate method for analyzing MTMM matrices (Crano, 2000). We used the "correlated uniquenesses" method recommended by Kenny and Kashy (1992). A two-factor model was estimated. Each factor (procrastination and conscientiousness) had three indicators (ratings by teacher, parent, and self-report). The error factors were allowed to correlate within methods, and the correlation between the two factors was estimated. For identification purposes, the loadings of teacher ratings on procrastination and conscientiousness were fixed to 1.00.

This model fit the data well:

$(\chi^2_{(5)} = 6.92, p = .23; \text{Bentler-Bonnett Normed Fit Index [NFI]} = .98; \text{Non-Normed Fit Index [NNFI]} = .98; \text{Comparative Fit Index [CFI]} = .99)$.

Parameter estimates for the model are presented in Table 3. The procrastination subscale loads significantly on the procrastination factor and the conscientiousness subscale loads significantly on the conscientiousness factor, providing evidence for the convergent validity of the scale.

As expected, procrastination and conscientiousness are very highly correlated; these traits are so highly correlated as to suggest that these two traits are largely redundant. In fact, Lay and his colleagues have suggested that procrastination is an aspect of low conscientiousness (Lay & Brokenshire, 1997; Schouwenburg & Lay, 1995). To explore this possibility, we conducted a CFA specifying only one factor. Once again, the error factors were allowed to correlate within methods. The loading for teacher ratings of procrastination was fixed at 1.00.

Table 2
Multitrait/Multimethod Matrix Relating Self-Report, Parent, and Teacher Ratings of Procrastination and Conscientiousness

		Self-Report		Parents		Teachers	
		1.	2.	3.	4.	5.	6.
1. Self-report	Procrastination	1	-.68**	.35**	-.27*	.44**	-.43**
2.	Conscientiousness		1	-.37**	.30*	-.38**	.46**
3. Parents	Procrastination			1	-.60**	.42**	-.53**
4.	Conscientiousness				1	-.50**	.67**
5 Teachers	Procrastination					1	-.82**
6.	Conscientiousness						1

* $p < .01$; ** $p < .001$.

Note: High scores indicate greater procrastination and greater conscientiousness.

This model also fit the data

$$(\chi^2_{(6)} = 9.86, p = .13; NFI = .97; NNFI = .97; CFI = .99).$$

A chi-square difference test suggests that the two-factor model provides, at best, a marginally better fit to the data

$$(\chi^2_{(1)} = 2.93, p = .09).$$

On the other hand, there are historical and conceptual reasons to consider procrastination and conscientiousness separately. Therefore, we will report results both for scores of the two constructs separately, as well as for a total score, coded so that high scores represent high conscientiousness ($\alpha = .83$). The correlation of the total scale score with the total ratings by parents was $r = .38$ ($p < .0001$); with the total of the ratings by teachers it was $r = .46$ ($p < .0001$). The correlation between total teacher ratings and total parents ratings was $r = .66$ ($p < .0001$).

Conscientiousness, Procrastination, and Anxiety

The alpha reliability estimate for the RCMAS total anxiety score was $\alpha = .82$. Reliability for the Worry/Oversensitivity Subscale ($\alpha = .79$), the Social Concerns/Concentration Subscale ($\alpha = .70$), and the Lie Scale ($\alpha = .74$) were all well within an acceptable range. The alpha reliability of the Physiological Anxiety Scale was somewhat lower ($\alpha = .57$).

Correlations among the Procrastination and Conscientiousness Scales and the scales and subscales of the RCMAS are reported in Table 4. Consistent with research on adults, children who were higher in self-reported procrastination were also higher in manifest anxiety; children higher in conscientiousness were lower in manifest anxiety. This relationship appears to be due to correlations with physiological anxiety and with social concerns/concentration. These two subscales are,

themselves, correlated ($r = .53$). Partial correlations between physiological anxiety and procrastination/conscientiousness, controlling for social concerns/concentration, are still significant (for procrastination, partial $r = .25$; for conscientiousness, partial $r = .26$; for total scale, partial $r = .27$; all $p < .01$). On the other hand, partial correlations between the Procrastination/Conscientiousness and the Social Concerns subscales, controlling for physiological anxiety, are smaller (for procrastination, partial $r = .12$, $p = .24$; for conscientiousness, partial $r = .22$, $p = .03$; for total scale score, $r = .17$, $p = .09$).

Table 4
Correlations Between Procrastination/Conscientiousness and Anxiety and Goal Orientation

	Procrastination	Conscientiousness	Total Procrastination and Conscientiousness Scale
Total Anxiety	0.25*	-0.28*	-0.39*
Worry/Oversensitivity	0.12	-0.19	-0.18
Physiological Anxiety	0.39*	-0.40*	-0.42*
Social Concerns/Concentration	0.28*	-0.35*	-0.36*
RCMAS Lie Scale	-0.11	0.22	0.19
Task Orientation	0.40*	-0.48*	-0.40*
Avoidance Orientation	-0.33*	0.35*	0.33*
Self-Enhancing Orientation	-0.02	-0.03	.00
Self-Defeating Orientation	-0.03	-0.01	.04

* $p < .05$ (Bonferroni Corrected).

Note: RCMAS – Revised Children’s Manifest Anxiety Scale. The probability levels reported as significance values in this table are corrected for the fact that the table contains as many as 18 independent correlations. All correlations marked as significant are at the probability level $p < .05/18 = .0027$.

Conscientiousness, Procrastination, and Goal Orientation

The GOS provided generally reliable measurement of three goal orientations: Task Orientation ($\alpha = .74$), Self-Enhancing Orientation ($\alpha = .82$), and Self-Defeating Orientation ($\alpha = .76$). The reliability of Avoidance Orientation scores was lower ($\alpha = .60$).

An exploratory factor analysis of the GOS showed that one item (“I try not to be one of the worst students at school”), intended to measure the Self-Defeating Ego Orientation, did not load on the intended factor (probably because it referred more to internally perceived normative comparisons than to self-presentational concerns; other items in this factor focused on concerns about appearing inadequate or inferior). The Self-Defeating Ego Orientation Scale was recalculated without this item. The alpha reliability of the revised scale was $\alpha = .77$.

Procrastination and conscientiousness correlated with the Avoidance and Task Orientation subscales. Neither individual scale, nor the total scale, correlated with the Self-Enhancing or Self-Defeating orientations (Table 4). Furthermore, the task

and avoidance orientations did not share any variance ($r = -.03$), suggesting that procrastination and conscientiousness are independently related to each of these orientations.

Discussion

The goals of the current research were both to add to the empirical database supporting the psychometric quality of Lay et al.'s measure of conscientiousness and procrastination, and to explore how procrastination and conscientiousness relate to anxiety and achievement goal orientation.

On the Psychometric Quality of the Procrastination/Conscientiousness Scale

Reliability. The psychometric properties of the questionnaire are generally good. Closely replicating findings reported by Lay et al., the individual (procrastination, conscientiousness) subscales provided good internal consistency reliability for use in research settings and the conscientiousness facet subscales have poor reliability. The reliability estimate for the total procrastination and conscientiousness scale is also good for research purposes.

On the other hand, the estimates of internal consistency reliability for the overall scale, and especially for the two subscales, are somewhat low compared with many recommendations for the use of instruments to make decisions about individuals (cf., e.g., Nunnally & Bernstein, 1994). However, the reliability of measures of personality constructs will usually not be as high as measures of cognitive abilities (Aiken, 1999). In fact, such frequently used personality measures as the Minnesota Multi-Phasic Personality Inventory (MMPI) and the California Personality Inventory (CPI) generally have subscale reliabilities no higher than .85 (on the MMPI, see Hunsley, Hanson, & Parker, 1988; on the CPI, see Groth-Marnat, 1997). While it is certainly desirable to increase the reliability of the scale (if it can be done without sacrificing validity), the internal consistency of at least the overall Lay scale appears to meet minimal standards.

Discriminant and convergent validity. Our data add to the nomothetic network of supporting relations addressing the validity of the Lay et al. scale. The correlation of scale scores with anxiety and goal orientation were consistent with previous research (with college students and adults) on these constructs. Furthermore, the analysis of the MTMM matrix adds support to the validity of the scale. Virtually nothing in the current study, however, suggests that we can differentially measure procrastination and conscientiousness. In particular, the results of the CFA of the multitrait/multimethod matrix suggest that our measures of procrastination and conscientiousness are highly correlated.

Whether or not this lack of discrimination is a problem for the Lay et al. scale, however, depends on how one views the constructs to be measured. As discussed

previously, some theorists (particularly, Clarry Lay, the primary developer of the measure under study) have suggested that procrastination is simply one aspect of (low) conscientiousness (Lay & Brokenshire, 1997; Schouwenburg & Lay, 1995). In this conceptualization, we would not expect to be able to measure the two constructs separately, because they are not separate constructs.

Goal Orientation and Procrastination/Conscientiousness

The correlations between the Procrastination/Conscientiousness measure and the various subscales from Skaalvik's (1997) Goal Orientation Scale also provide evidence that the Procrastination/Conscientiousness Scale provides valid measurement. The fact that conscientiousness and procrastination correlated with the task-related orientations, and not with the ego-related orientations, is consistent with correlations among related measures in a college student population (Scher et al., 2000).

Scher et al. (2000) also asked participants to report on tasks which they completed, tasks which they put off, and tasks which they did instead of the put-off tasks. Participants then rated each of the three tasks on 39 dimensions corresponding to both task-related (mastery, pleasure, and task aversiveness) and ego-related (ego-approach and ego-avoidance) goals. The task-related goals, and not the ego-related goals, were related to how much time people spent on their tasks. This pattern of correlations seems to call into question the commonly assumed relationship between procrastination and fear of failure (e.g., Ellis & Knaus, 1977; Rothblum, 1990). Fear of failure is a trait most closely related to ego-based concerns. However, our findings, combined with the findings summarized in the previous paragraph, suggest that procrastination may be more closely associated with task-related features (see also Schouwenburg, 1992, 1995).

These findings suggest that interventions to reduce procrastination should be focused on features of the task and/or on the way in which individuals interpret these task features. Interventions designed to bolster self-esteem, to combat fear of failure, or to affect other ego-related aspects of the procrastinating child are less likely to be successful.

Relationship of Anxiety With Conscientiousness and Procrastination: Toward an Affect-Control Model of Procrastination

If procrastination was related to fear of failure, moreover, we would expect it to correlate with the Worry or Social Concerns/Concentration subscales of the RCMAS. The fact that the Procrastination/Conscientiousness measure was most strongly related to Physiological Anxiety suggests that some other explanation is needed. One possibility grows out of a conceptualization of procrastination as an affect control process (cf., Gross, 1998; Westen, 1994, on affect control). Both situational and dispositional procrastination may stem from a need to regulate one's affective state. There may be something about procrastinators—perhaps temperament—which

leads them to experience more physiological symptoms of anxiety. Mastery-oriented tasks allow procrastinators to focus on positive emotions, and to avoid aversive and anxiety-provoking activities. Thus, procrastinators may be attempting to regulate their dispositional anxiety through their procrastination.

Scher, Ferrari, & Nelson (2000) report evidence consistent with this notion. Participants' reported completing more of tasks rated as creating a sense of mastery. However, this effect was moderated by participants' level of dispositional positive affect (PA; as measured by Watson, Clark, & Tellegen's (1988) Positive and Negative (Affect Scales [PANAS])). For those individuals high in PA, the degree of mastery a task provided was less important than it was for those lower in PA. A similar interaction between PA and task aversiveness was marginally significant. Those high in PA—like those in the current study who are low in physiological anxiety—have less of a need to regulate their affect: they are already in a more positive affective state. Therefore, there is less of an effect of the mastery-creating qualities of their tasks. Future research should focus on identifying the affective antecedents of procrastination, including an attempt to experimentally verify the causal role of affect and anxiety in causing task delay.

Future research should also be directed at exploring the roots and developmental course of procrastinators' greater physiological anxiety. The continued verification of the psychometric quality of Lay et al.'s (1998) Procrastination and Conscientiousness measure should help this process considerably. Improved measurement of procrastination in children will be of little value, however, unless we can develop interventions that will help procrastinators reduce their procrastination and improve their academic outcomes. If our affect-regulation model of procrastination is correct, then interventions should be developed that focus on providing alternative means of improving the affect of procrastinators. Additionally, attempts at increasing the mastery focus of tasks might be beneficial. However, these interventions can come only after a more detailed development and testing of this theory.

So, there is still more research to be done—but, we'll put that off until tomorrow.

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