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Temperament and Personality: An Exploratory Interinventory Study of the DOTS-R, EASI-II, and EPI

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This exploratory study investigated the interinventory relations of constructs measured by the Revised Dimensions of Temperament Survey (DOTS-R), the Emotionality, Activity, Sociability, Impulsivity (EASI-II) temperament measure, and Eysenck's Personality Inventory (EPI). The zero-order correlational data collected from 153 college students provided concurrent validity for the DOTS-R attributes in relation to the EASI-II and EPI traits. Neuroticism was negatively correlated with the DOTS-R attributes of (low) distractibility, approach-withdrawal, flexibility-rigidity, mood quality, and two rhythmicity dimensions; extraversion was positively correlated with activity level-general, approach-withdrawal, flexibility-rigidity, and mood quality. Moderate-to-high correlations were found between similarly labeled attributes of the three inventories and low correlations were generally found between dissimilarly labeled attributes. Multiple regression analysis, used to determine the degree of independence/redundancy among similarly labeled dimensions of the three measurement instruments, indicated a moderate degree of convergence among some of the attributes of the three measures.

The potential benefits derived from studying interinventory relations often have been emphasized, though less often practiced (Campbell & Chun, 1977; Hundleby & Connor, 1968). Exploring interinventory relations facilitates the comparison of constructs which may be labeled similarly (or differently) in various instruments and yet may manifest intercorrelations ranging anywhere from negative one to positive one. This study investigated the interrelationships of constructs measured by three temperament/personality self-report inventories. For the purposes of this study, temperament and personality are used interchangeably in reference to characteristic response tendencies or dispositions. This is not intended to trivialize the importance of metatheoretical

distinctions that exist within and between the respective approaches of personality and temperament theoreticians (e.g., Buss & Plomin, 1984; Cattell, 1957; J. V. Lerner & R. M. Lerner, 1983; Strelau, 1983). Rather, consonant with the objectives of some temperament and personality researchers (e.g., Costa, McCrae, & Arenberg, 1983; Digman & Inouye, 1986; Goldsmith & Campos, 1982; Wiggins & Broughton, 1985), effort is directed toward the attainment of the most parsimonious structural model to characterize the attributes measured by the three inventories. The three measures used were the DOTS-R (Windle & R. M. Lerner, 1986), Buss and Plomin's (1975) EASI-II temperament measure, and EPI (H. J. Eysenck & S. B. Eysenck, 1968). At the conceptual level, there appears to be considerable overlap among some of the constructs measured by these inventories and yet differences among others. The primary purpose of this study was to use quantitative procedures to assess empirically the amount of redundancy and independence among the constructs measured by these three inventories.

A secondary purpose of this study, embedded within the first, was to investigate the concurrent validity of the DOTS-R. Whereas a considerable amount of research has been conducted with the EPI and the EASI (and its variants), the DOTS-R is of more recent origin and has yet to have widespread use. The current study provided an opportunity to support the concurrent validity of the DOTS-R attributes via comparisons with the factors of two personality/temperament inventories whose measured traits are fairly well established within structural models of personality (e.g., Digman & Inouye, 1986; Wiggins & Broughton, 1985).

The DOTS-R is a 54-item, multifactorial questionnaire designed to measure several of the more salient dimensions of temperament, or behavioral style, consistent with those identified by Thomas and Chess (1977) in the New York Longitudinal Study. In order to enhance the testing of some central theoretical notions in developmental psychology in general (e.g., continuity/discontinuity of temperament across time) and a goodness of fit model of temperament-context relations in particular (e.g., J. V. Lerner & R. M. Lerner, 1983; Windle et al., 1986), the DOTS-R (Windle & R. M. Lerner, 1986) was developed as an age continuous measure of temperament from early childhood to early adulthood. The language and content of items are understandable and applicable for participants across this relatively wide age range.

In the construction of the DOTS-R, data from three samples differing in age (preschoolers, sixth graders, and young adults) were simultaneously analyzed. An identical set of 106 items was administered to each sample, with sixth graders and young adults giving self-reports and primary caregivers reported on their preschooler's temperament. A sequence of analyses was conducted in which criteria, applied to all three samples, were established for items to remain in the item pool for the successive stages of analyses. For example, item-to-total

subscale correlations had to be greater-than-or-equal-to .15 in two of the three samples to remain in the item pool. Following a sequence of analyses, 54 items remained and formed the basis of the DOTS-R. A 9-factor model emerged from these 54 items for the preschool and sixth-grade samples, and a 10-factor model emerged for the young adult sample. High congruity levels (via congruence coefficients) were found for the following eight factors which emerged for all three samples: Activity Level–General, Activity Level–Sleep, Approach–Withdrawal, Flexibility–Rigidity, Quality of Mood, Rhythmicity–Sleep, Rhythmicity–Eating, and Rhythmicity–Daily Habits. High congruity was also found for the factor of Task-Orientation between the preschool and sixth-grade samples. This factor differentiated for the young adult sample into the factors of Distractibility and Persistence. A brief description of each of the 10 factors used in the current study are provided in Table 1.

Although the dimensional labels of the first six temperament factors in Table 1 bear a strong resemblance to concepts used frequently in personality research, the last four do not. However, the measurement of rhythmicity dimensions and sleep activity is quite common among developmentalists and clinicians investigating temperamental variation in infancy, childhood, and adolescence (e.g., Hubert, Wachs, Peters-Martin, & Gandour, 1982; J. V. Lerner & R. M. Lerner, 1986; Plomin & Dunn, 1986). In particular, those researchers influenced by the findings of the New York Longitudinal Study (Thomas & Chess, 1977; Thomas, Chess, & Birch, 1968) characteristically have measured these factors and have conceptualized them as features of individuality which influence, and are influenced by, social interactions with significant others (e.g., parents and siblings), and are, therefore, involved in psychosocial development and behavioral adjustment. The relationships of these four temperament attributes to factors of the EPI and EASI-II are exploratory, with no expectation for redundant relations with constructs assessed by these two measures.

Support for the predictive or concurrent validity of the DOTS-R has been reported by Windle et al. (1986) and Windle (1987). Statistically significant relationships with young adult samples were found between DOTS-R attributes and indices of perceived self-competence in cognitive and social domains as well as relationships with measures of self-esteem, depression, general mental health, and stressful life events. Similar significant relationships were found between the DOTS-R attributes and measures of perceived competence and academic performance for a sample of elementary school children.

Whereas the DOTS-R is of more recent origin, the EPI (H. J. Eysenck & S. B. Eysenck, 1968) is one of the most thoroughly researched personality instruments in existence (for reviews, see H. J. Eysenck & S. B. Eysenck, 1969; Morris, 1979). Factor analytic techniques were used in the construction of the EPI and the two traits measured, sometimes referred to as *superfactors*, are Extraversion–Introversion and Neuroticism–Stability. These two global traits correspond to

TABLE 1
Brief Description of 10 Temperament Factors Measured by the DOTS-R

Temperament Factor	*High Score*	*Low Score*
Low Distractibility	Tendency to be able to concentrate and maintain perceptual focus despite extraneous stimuli	Tendency to lose concentration easily when potentially distracting extraneous stimuli are present
Persistence	Tendency to stay with, or continue steadily in, an activity for a relatively long period of time	Tendency to have difficulty staying with, or continuing steadily in, an activity for a relative long period of time
Activity Level–General	High characteristic level of energy, vigor, and overt motor activity	Low characteristic level of energy, vigor, and overt motor activity
Approach–Withdrawal	Tendency to approach, that is, to move towards, new persons, objects, situations, or events	Tendency to withdraw, that is, to move away from, new persons, objects, situations, or events
Flexibility–Rigidity	Tendency to respond flexibly to changes in the environment	Tendency to respond inflexibly or rigidly to changes in the environment
Mood Quality	High characteristic manifestation of positive affect (e.g., smiling, cheerful)	Low characteristic manifestation of positive affect (e.g., infrequent smiling, not cheerful)
Activity Level–Sleep	High characteristic motor activity (e.g., tossing-and-turning) during sleep	Low characteristic motor activity during sleep
Rhythmicity–Eating	High characteristic regularity of eating habits pertinent to appetite and quantity consumed	High characteristic irregularity of eating habits pertinent to appetite and quantity consumed
Rhythmicity–Sleep	Tendency for timing of daily sleep–wake cycle to be highly regular, that is, varying little from day-to-day	Tendency for timing of daily sleep–wake cycle to be highly irregular, that is, varying considerable from day-to-day
Rhythmicity–Daily Habits	Tendency to be highly regular in the timing of *diurnal* activities, such as toileting, peak period of feeling full of pep and energy, taking a rest or break in daily activities	Tendency to be highly irregular in the timing of *diurnal* activities, such as toileting, peak period of feeling full of pep and energy, taking a rest or break in daily activities

major factors found in many other personality inventories, and similar factors have emerged for the second-order factors of the 16 Personality Factor Questionnaire (P. F.; Catteil & Nichols, 1972).

H. J. Eysenck and S. B. Eysenck (1969) suggested that Extraversion–Introversion consists of highly intercorrelated dimensions of sociability and impulsivity as well as narrow specific dimensions such as jocularity and quick-wittedness. A number of other researchers (e.g., Guilford, 1975; Howarth, 1976; Plomin, 1976) have criticized the dimensionality of the Extraversion–

Introversion factor of the EPI, suggesting that impulsivity is a multiple factor construct and that the EPI measures a restricted component of sociability. Much less criticism has been directed toward the Neuroticism factor.

The development of the EASI and its modified versions were reviewed by Buss and Plomin (1975). A major impetous for constructing the EASI was that Buss and Plomin sought a factorially pure measure to identify temperament traits with a strong genetic component. A critical appraisal of existing personality measures, including the EPI, led them to propose an alternative decomposition of temperament structure, consisting of the four factors of Emotionality, Activity, Sociability, and Impulsivity. Items were generated to measure each of these four factors and exploratory factor analysis was used to identify and support the structure of these four temperament traits (Buss & Plomin, 1975; Plomin, 1976).

Subsequent research by Buss and Plomin (1984) and others (e.g., H. J. Eysenck, 1983; Rowe & Plomin, 1977) has indicated that impulsivity is a multidimensional construct, with components such as inhibitory control, nonplanning, and sensation seeking. Buss and Plomin (1984) deleted items relating to impulsivity in their most recent temperament measure and have concentrated their efforts on the factors of Emotionality, Activity, and Sociability. They further suggested that Eysenck's extraversion trait is a combination of their Sociability factor plus a component of shyness, thus, "Extraverts are sociable and not shy; introverts are unsociable and shy" (p. 81). Eysenck's neuroticism trait is proposed to consist of emotionality in combination with the classical conditioning of fear and avoidance.

Although my study was not designed to test for an exact mapping of EAS or EASI dimensions onto Eysenck's two major traits, it did provide a means for comparing shared sources of variance among the factors measured. The Impulsivity factor of the EASI–II also was included in the analysis to explore its interrelationships with the dimensions of the EPI and DOTS–R.

METHOD

Subjects

One hundred fifty-three young adults recruited from two introductory human development courses held during the winter term of 1984 participated in the study. The sample consisted primarily of women (83%) with mean age equal of 21.49 years (SD = 4.22). The sample was predominately (over 94%) White, and religious affiliation tended to be either Protestant (64%) or Catholic (33%).

Sex differences across the 16 temperament/personality attributes were examined two ways. First, a conservative multivariate statistic (Box's M) indicated that the variance–covariance matrices of the two gender groups were not

equivalent, $\chi^2(136) = 205.76$, $p < .001$. Second, the average (absolute) point-biserial correlation between the discrete sex variable and each of the 16 temperament/personality attributes was .10. Furthermore, only 5 of the 16 point-biserial correlations were statistically significant: distractibility = $-.14$, $p < .05$; sociability = .16, $p < .05$; rhythmicity–daily habits = $-.17$, $p < .05$; persistence = $-.19$, $p < .01$; and emotionality = .26, $p < .001$. Given the relatively small magnitude of the correlations separating men and women, gender groups were pooled for subsequent analyses.

Measures

DOTS-R. The DOTS-R Adult form is a 54-item, self-report questionnaire which assesses 10 orthogonal temperament attributes (Windle & R. M. Lerner, 1986). A 4-point response format is used for each of the 54 items, ranging from *usually false* (1) to *usually true* (4). The DOTS-R Adult form measures the following 10 temperament attributes factors: Activity Level–General, Activity Level–Sleep, Approach–Withdrawal, Flexibility–Rigidity, Quality of Mood, Rhythmicity–Sleep, Rhythmicity–Eating, Rhythmicity–Daily Habits, Distractibility, and Persistence. Internal consistency coefficients (Cronbach alphas) for a sample of 300 young adults reported by Windle and Lerner (1986) were .84, .89, .85, .78, .89, .78, .80, .62, .81, and .74, respectively, for the 10 factors just listed. For a sample of 179 young adults, test–retest correlations with an interval of 6 weeks between testing sessions were .75, .74, .69, .64, .63, .71, .72, .62, .64, and .59, respectively, for the 10 factors just listed. Concurrent or predictive validity for the DOTS-R with young adult samples has been provided by Windle et al. (1986) and Windle (1987). In addition, a factorial replication study with a sample of young adults has supported the dimensional structure of the DOTS-R (Windle, in press).

Scoring the DOTS-R involves the assignment of a 1, 2, 3, or 4 to each item in accord with the subject's endorsement of the item along the continuum ranging from *usually false* (1) to *usually true* (4). Response alternative 2 is *more false than true*, and response alternative 3 is *more true than false*. To limit the influence of some response set tendencies, 15 items are reversed in terms of directionality of scoring and must be reversed before summing items to form subscale scores. The 15 reversal items represent slightly less than 28% of the items and are randomly dispersed throughout the test form. This percentage of reversal items compares favorably with other standardized temperament/personality self-report measures, including the EASI-II and the EPI. The direction of scoring each of the attributes is provided in Table 1. Based on the number of items per attribute on the DOTS-R, the range of scores for each dimension is: activity level–general, 7–28; activity level–sleep, 4–16; approach–withdrawal, 7–28; flexibility–rigidity, 5–20; mood, 7–28; rhythmicity–sleep, 6–24; rhythmicity–eating,

5–20; rhythmicity—daily habits, 5–20; low distractibility, 5–20; and persistence, 3–12.

EASI–II. The acronym EASI represents the four measured temperament factors of Emotionality, Activity, Sociability, and Impulsivity (Buss & Plomin, 1975). Each of these four traits is measured by five items. Each of the 20 items is rated on a scale ranging from *a little* (1) to *a lot* (5). The initial version of the EASI (EASI–I) revealed the same four temperament traits as the EASI–II, only high factor intercorrelations were found for the Factors of Activity and Impulsivity, and separately for Emotionality and Impulsivity. These findings were incongruent with the orthogonal factor structure proposed by Buss and Plomin (1975). EASI–II included the replacement of two activity items which correlated with impulsivity items and a modification of two emotionality items. The EASI–II was administered to a college sample of 82 men and 89 women. Subsequent principal-axes factor analysis indicated that these revisions sufficiently reduced the intercorrelation between the Factors of Activity and Impulsivity and yielded a moderate intercorrelation between Emotionality and Impulsivity (.29 for men; .37 for women).

EPI. Form A of the EPI (H. J. Eysenck & S. B. Eysenck, 1968) was used to measure the two major personality dimensions of extraversion–introversion and neuroticism–stability. Form A consists of 57 items with a dichotomous yes–no response format for each item. Scores for each of the two major factors are derived by summing across the 24 items that measure each factor. A third subscale, composed of nine items, may be derived to assess response tendencies to misrepresent oneself or to lie on this self-report measure.

RESULTS

Data analyses for the study are presented in two parts. First, analyses pertinent to the concurrent validity of the DOTS–R attributes are provided by analyzing the zero-order correlations of the DOTS–R attributes with the six traits measured by the combined dimensions of the EASI–II and the EPI. Second, to address issues of redundancy and independence among constructs labeled similarly, multiple regression analyses were conducted. The objective of the multiple regression analyses were not to examine the amount of independence and redundancy across temperament/personality instruments, but rather, more specifically, to assess independence/redundancy across constructs similarly labeled (e.g., extraversion, sociability, and approach–withdrawal).

Correlational Analysis

Pearson product–moment correlations were calculated among the dimensions measured by the three temperament measurement instruments. The between

batteries zero-order correlations are of primary importance in investigating interrelationships among the attributes and traits measured by the respective instruments. These relationships are presented in Table 2. With regard to the zero-order correlations between the DOTS-R attributes and traits of the other two measures, many statistically significant correlations, some of moderate to high magnitude, are reported. Significant negative correlations were found for low distractibility and the dimensions of emotionality, neuroticism, and impulsivity, indicating that high distractibility was associated with higher scores on the three traits of neuroticism, emotionality, and impulsivity. Low scores on persistence (i.e., not very persistent) also are associated with high scores on emotionality and impulsivity. Activity level–general is significantly correlated with the six traits of the other two measures. The most powerful relationships (i.e., highest in magnitude) for activity level–general are found with the activity dimension of the EASI-II and the extraversion factor of the EPI. Approach–withdrawal manifests its most powerful relationships with extraversion and sociability. The negative correlation between approach–withdrawal and neuroticism indicates that a withdrawal behavioral style is associated with higher scores on neuroticism. Significant correlations are reported for five-of-the-six relationships between flexibility–rigidity and the other six traits. Most of these correlations are of moderate magnitude, with the highest one indicating that inflexibility, or rigidity, is associated with higher scores on neuroticism. Quality of mood was found to correlate significantly with four of the traits.

TABLE 2
Pearson Product-Moment Correlations Between DOTS-R Attributes and Dimensions of the EASI-II and EPI[a]

	EASI-II				*EPI*	
DOTS-R Attributes	*E*	*A*	*S*	*I*	*Extraversion*	*Neuroticism*
Low Distractibility	−.31**	.10	−.09	−.28**	−.11	−.24**
Persistence	−.21**	.15	−.03	−.40**	−.12	−.15
Activity Level–General	.24**	.48**	.26**	.36**	.47**	.19*
Approach–Withdrawal	.05	.26**	.42**	.03	.44**	−.23**
Flexibility–Rigidity	−.23**	.15	.29**	−.19*	.27**	−.38**
Mood Quality	−.23**	.19*	.38**	−.06	.38**	−.34**
Activity Sleep	.01	.01	.05	.05	.12	.03
Rhythmicity–Eating	−.09	−.03	.01	−.09	−.09	−.20*
Rhythmicity–Sleep	.10	.23**	−.08	−.12	−.04	−.21**
Rhythmicity–Daily Habits	−.16*	.12	.15	−.05	.09	−.13
EPI						
Extraversion	.09	.42**	.61**	.32**	–	–
Neuroticism	.46**	−.08	−.08	.29**	–	–

[a]$N = 153$.
*$p < .05$. **$p < .01$.

Positive relations were reported between quality of mood and the dimensions of extraversion and sociability. Negative relations were reported between quality of mood and the dimensions of neuroticism and emotionality. Thus, positive quality of mood is inversely related to high scores on neuroticism and emotionality.

Although a number of statistically significant correlations were found between the six DOTS-R attributes of low distractibility, persistence, activity level–general, approach–withdrawal, flexibility–rigidity, and mood quality, and the EASI-II and EPI dimensions, few statistically significant correlations were found between the three rhythmicity dimensions–activity sleep and the EASI-II and EPI dimensions. Rhythmicity–eating and rhythmicity–sleep were significantly related to neuroticism, but the magnitude of these relationships was low. Similarly, rhythmicity–daily habits manifested a significant but low correlation with emotionality. All three of these correlations are negative, indicating that irregularity of behavioral functioning is associated with heightened emotionality and neuroticism. Rhythmicity–sleep also was correlated significantly with the activity dimension of the EASI-II, indicating that higher activity is associated with more regularity of sleeping behavior.

Overall, the data in Table 2 suggest that a number of the DOTS-R attributes are significantly and differentially related to traits measured by the EASI-II and the EPI. The pattern and magnitude of significant and nonsignificant correlations generally were in the direction of similarly labeled dimensions from the DOTS-R and EASI-II and EPI manifesting the highest relationships. For example, the magnitude of the correlations between approach–withdrawal and sociability and extraversion were higher than other approach–withdrawal-temperament bivariate relationships. In a similar vein, activity level–general manifested its highest correlations with activity and extraversion. The conceptual dissimilarity between the DOTS-R rhythmicity dimensions and activity–sleep and the dimensions of the EASI-II and EPI was further indicated by the obtained empirical associations (i.e., Pearson correlations).

The zero-order correlations between the EASI-II and the EPI dimensions indicate a highly significant correlation between extraversion and sociability and a moderate relationship between extraversion and activity. Neuroticism was significantly correlated with emotionality, and both neuroticism and extraversion were moderately correlated with impulsivity. These correlations were, therefore, in the direction proposed by Buss and Plomin (1984), though neither shyness nor fear and avoidance dimensions were included in this study, thus limiting a precise testing of the proposals of Buss and Plomin regarding the interrelationships between the EPI and EAS dimensions.

Multiple Regression Analyses

The correlational analysis indicated some convergence between some of the dimensions of DOTS-R and some of the dimensions of the EASI-II and the EPI.

In order to further investigate the independence/redundancy of the DOTS-R attributes in relation to the EASI-II and EPI traits, six separate multiple regression equations were specified and solved. Although attributes from any of the three inventories could have been specified as dependent variables, the six DOTS-R attributes were selected as dependent variables for these equations due to the increased number of attributes for the DOTS-R. Two independent variables, one from the EASI-II and one from the EPI, with conceptually similar labels as each of the dependent variables, were used as predictors in each of the six equations. For example, extraversion and sociability were used as predictors of approach–withdrawal. Conceptually, none of the traits from the EASI-II or EPI were similar to the three rhythmicity or the activity level–sleep attributes of the DOTS-R and, thus, no regression equations were specified. Given that there was no theoretical rationale for the order of entry of either the EASI-II or EPI predictors in the multiple regression equations, a maximum R regression procedure was used. This choice was consistent with the objective of pursuing the degree of redundancy among the measures.

Table 3 summarizes the results of the six multiple regression equations. In order to adjust for multiple simultaneous comparisons across the six regression equations, Bonferroni corrections were used (Rosenthal & Rubin, 1984). The

TABLE 3
Multiple Regressions Predicting DOTS-R Temperament Attributes With EASI-II and EPI Traits[a]

Dependent Variable: *Predictors*	*Multiple R*	R^2	*Beta*	*F*(2, 151)[b]
Low Distractibility:				
Neuroticism			−.13	5.86*
Impulsivity	.34	.12	−.16	6.56*
Persistence:				
Neuroticism			−.03	1.26
Impulsivity	.40	.16	−.16	19.61*
Activity Level–General:				
Extraversion			.34	17.98*
Activity	.57	.33	.33	22.40*
Approach–Withdrawal:				
Sociability			.29	7.04*
Extraversion	.48	.23	.27	9.04*
Flexibility–Rigidity:				
Neuroticism			−.17	13.54*
Emotionality	.39	.15	−.08	1.71
Mood Quality:				
Emotionality			−.10	1.76
Neuroticism	.35	.12	−.19	10.30*

[a]N = 153. [b]F-values and significance probabilities associated with the Type II sums of squares. *$p < .01$.

reported alpha levels in Table 3 include the Bonferroni adjustment. The Multiple *R*s for the six regression equations ranged from .34 to .57, with a mean of .42. The highest Multiple *R* resulted from the regression of activity level–general on extraversion and activity. The lowest Multiple *R* resulted from the regression of distractibility on neuroticism and impulsivity. The direction of the beta weights for the predictors in all six equations were consistent with the zero-order correlational findings. *F* values, presented in the last column of Table 3, indicate that in three of the regression equations, both predictors were statistically significant, whereas in the other three equations, only one of the predictors was statistically significant. These findings suggest that for the three regression equations where both predictors were statistically significant, each predictor made a statistically reliable contribution in accounting for the variance of the particular dependent variable. For the other three regression equations, only one of the predictors made a statistically reliable contribution in accounting for the variance of the particular dependent variable, suggesting that the nonsignificant predictor had little unique variance to contribute in accounting for the variance in the particular dependent variable once the significant predictor was entered into the equation. Given the statistical significance of the zero-order correlations between each predictor and outcome variable in some of these regression equations (e.g., neuroticism, emotionality, and flexibility–rigidity), redundancy among some of the predictors is indicated.

DISCUSSION

This investigation into the interinventory relations among the DOTS-R, EASI-II, and EPI provided several interesting findings. Differential relations were found between the DOTS-R attributes and the traits of the EASI-II and the EPI. The direction and magnitude of these relationships were largely in accord with what one would expect if consistency in the labeling of constructs across the three measurement instruments was assumed. For instance, moderately negative relationships were found between neuroticism and the DOTS-R attributes of distractibility, approach–withdrawal, flexibility–rigidity, mood quality, and the two rhythmicity dimensions relating to the regularity of eating and sleeping behavior. The negative or inverse relationships indicate that high neuroticism is associated with withdrawal behavior, inflexibility, low quality of mood, high distractibility, and arrhythmicity of eating and sleeping behavior. These findings are congruent with previous correlational studies with the DOTS-R and indices of psychological health (e.g., Windle et al., 1986; Windle, 1987) and with temperament-disordered behavior relationships found by other researchers (e.g., Thomas et al., 1968).

In contrast to the negative relationships found between neuroticism and several of the DOTS-R attributes, positive relationships were reported between

extraversion and the DOTS-R attributes of activity level–general, approach–withdrawal, flexibility–rigidity, and mood quality. The positive relationship between these constructs indicates that extraversion is more highly associated with higher general activity, approach behavior, flexibility, and positive quality of mood. These findings are consistent with previous theorizing about the extraversion construct (H. J. Eysenck & S. B. Eysenck, 1969; Morris, 1979). That is, extraverts are characterized as more socially oriented (approach oriented), outgoing (higher motor activity level), carefree, and emotionally expressive (which may be reflected in positive quality of mood). Conversely, introverts are characterized as more socially inhibited (withdrawal oriented), quiet and reserved (lower motor activity level), and emotionally unexpressive. The relationship of behavioral flexibility to extraversion, which is of lower magnitude than the relationships of extraversion to the other three DOTS-R attributes, may, in part, be accounted for by the introverts preference for ordering in contrast to extraverts preference for novelty and change. The content of the items for flexibility–rigidity pertain to the ease or difficulty of adjusting to changes in the environment. Such changes may be perceived as more difficult to adjust to for introverts and easier to adjust to for extraverts.

With regard to the relationship of impulsivity to the DOTS-R attributes, impulsivity was found to be associated negatively with distractibility, persistence, and flexibility–rigidity and positively with general activity level. The negative relationships are consistent with findings of poor inhibitory control being associated with high susceptibility to distraction and low persistence. The positive relationship with general activity level is consistent with findings which suggest that a component of impulsivity is associated with sensation seeking (e.g., H. J. Eysenck, 1983). The magnitude of these relationships were low to moderate and considered in conjunction with the correlations between impulsivity and the two EPI traits of extraversion and neuroticism, further supports the multidimensionality of the impulsivity construct (Buss & Plomin, 1984).

In sum, the correlational findings were supportive of the concurrent validity of the DOTS-R attributes in relation to the EASI-II and EPI temperament constructs. Furthermore, the pattern of interrelationships among the dimensions of the three inventories indicated that the attributes of the DOTS-R manifested moderate-to-high correlations with traits that might be anticipated (based on the similarity of factor labels) and near zero correlations with other traits. The multiple regression analysis substantiated the findings of the correlational analysis by indicating that moderate proportions of variance in some DOTS-R attributes could be accounted for by selected predictors from the EASI-II and EPI. These findings suggest that there is both redundancy and independence among the constructs measured by the three temperament measures.

In addition, for taxonomic purposes, the correlational data indicate that the DOTS-R attributes tend to correspond somewhat with the domains proposed

by some personality theorists (e.g., Digman & Inouye, 1986). For example, the attribute of approach–withdrawal may be envisaged as a member of the extraversion category, distractibility and persistence as members of the attentiveness–task orientation category, and flexibility–rigidity as a member of Digman and Inouye's intelligence or intellect category in that flexibility of responding to new situations may reflect "intelligent-like" dispositional behavior. General activity level also often is classified as a member of the extraversion category. Some of the other DOTS–R attributes (e.g., rhythmicity dimensions) are not so easily classifiable under many existing personality structural schemes, although such schemes are best viewed as open-ended and may be modified to correspond with the findings of new temperament/personality constructs.

A few caveats are warranted regarding these findings. First, the sample was primarily composed of women. It would be beneficial in future studies to have a more balanced number of male and female participants and to conduct analyses which will permit a better assessment of gender differences and similarities among the constructs measured. Second, the age range in the current study also was limited to young adults. It would be of interest to see if similar relationships among constructs also held for different age groups. Third, there was no cross-validation sample in the current study and the Multiple *R*s and beta weights reported may be somewhat inflated due to chance factors (though the calculation of "shrunken" Multiple *R*s results in trivial departures from the obtained Multiple *R*s). Given the empirical findings of this exploratory study, it would be possible in future studies to use confirmatory factor analysis to constrain relations among certain attributes and to specify and test a more precise statistical model. This study also may be used as a springboard for future investigations among these self-report inventories and other methods of measurement (e.g., behavioral observation) which may conjointly define personality and temperament constructs. Particularly useful for such future investigations would be the use of restricted (confirmatory) structural models with multitrait–multimethod covariance data (e.g., Widman, 1985).

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