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## Temperament Differences Among Children with Conduct Disorder and Oppositional Defiant Disorder

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Temperament-based learning style preferences of 80 children, ages 8 to 17, 40 with conduct disorder (CD) and 40 with oppositional defiant disorder (ODD) were examined using the Student Styles Questionnaire (SSQ). The SSQ measures four dimensions of learning style preferences based on temperament theory (Extroverted-Introverted, Thinking-Feeling, Practical-Imaginative, and Organized-Flexible). Their *T*-scores were compared for strength of preference between the two disorders. In addition, analysis for frequency of preference among children with CD and ODD was compared to the frequency of preference typically found in the general population. When comparing the strength of temperament preferences of children with CD and ODD significant differences were noted only for Practical-Imaginative styles. Children with ODD displayed a stronger preference for acquiring and assessing new information in Practical styles than did children with CD. Students with CD or ODD did not differ significantly for strength of preference on Extroverted-Introverted, Thinking-Feeling, and Organized-Flexible styles. When comparing the frequency of temperament preferences of children with CD and ODD to preference rates found in the general population, significant differences were noted only for children with ODD. They more often indicated a preference for Practical and Thinking styles.

Key Words: Temperament, ODD, CD, Student Styles Questionnaire, Children

Children with conduct disorder (CD) comprise between less than 1% to more than 10% of the general population and the prevalence of oppositional defiant disorder (ODD) is reported to be between 2% and 16% (American Psychiatric Association [APA], 2000). Their symptomology ranges from mildly disruptive (e.g., arguing) to injurious (e.g., assault) behaviors. Although they represent a small percentage of students, their behaviors can have a tremendous impact on peers and their own academic achievement.

The Diagnostic and Statistical Manual of Mental Disorders-IV-TR (APA, 2000) criteria for children displaying a conduct disorder emphasize a repetitive and persistent pattern of behavior in which the basic rights of others or major age-appropriate societal norms or rules have been violated over a 12-month period. The DSM-IV-TR (APA, 2000) criteria for children displaying oppositional defiant disorder emphasize a pattern of negativistic, hostile, and defiant behavior lasting at least six months. Additionally, CD must be ruled-out and impaired learning or social functioning must be evident.

Due to the externalizing and disruptive nature of their behaviors, students with CD and ODD may receive special education services for emotional disturbance (ED). Although IDEA provides exclusion of students determined to be socially maladjusted they may be included if determined to also have an emotional disturbance. The inclusion of students with CD or ODD in special education is still debated and policies may vary by state and school districts as some states have not included the terminology "socially maladjusted" in their statutes and Board of Education rules. Special education services are provided to approximately 8.8% (5,775,722 nationally) of students ages 6-21. Emotionally Disturbed is the fourth largest category (8.2%, 473,663 students) of special education and the number of students enrolled has risen 18.4% since 1992 with a steady increase each year (U.S. Department of Education [U.S. DOE], 2002).

On average, per pupil, special education costs (\$12,639) are more than double those of regular education services (\$4,394) with additional costs (estimated \$1,086 per student) for eligibility determinations (U.S. DOE, 2002). Their service needs are further complicated by the high comorbidity rates for other disabilities including attention deficit disorders and specific learning disabilities (APA, 2000).

Within special education, the category of ED can require higher than average state and federally funded services resulting in considerable financial and professional personnel investment. For example, students with ED have a higher incidence of discipline referrals with nearly 50% of ED students being suspended or expelled at some time. They are also more likely than other disability groups to be served full-time in separate facilities (32.9%). In addition, externalizing behavior problems are linked with several negative long-term outcomes (e.g., higher dropout, school failure, maladjustment, and incarceration) that have both financial and emotional costs to the individuals and their communities (U.S. DOE, 2002).

An understanding of their temperament qualities that utilizes their strengths may provide insights leading to more effective interventions. Although the research for academic gains when matching teacher-student learning styles is mixed, there is strong support for other factors that effect behavior and thus have intervention implications. Cornett (1983) found significant positive affective regard when teachers and students were matched for learning styles, which can be important to behavioral dynamics of a classroom. Temperament learning styles have been identified as indicators of both academic persistence and graduation (Schurr, Ruble, Palomba, Pickerill, & Moore, 1997). Research on counselors' incorporation of components of a patient's style, in therapy, has resulted in lower therapy drop-out rates and voluntarily extension of number of treatment sessions (Myers, McCaulley, Quenk, & Hammer 1998).

### **TEMPERAMENT OF CHILDREN WITH ODD AND CD**

Temperament refers to traits or predispositions to display certain behavioral tendencies. They are presumed to have a biological basis and be relatively stable (Bates, Wachs, & Emde, 1994). Early historical temperament theory dates back to Hippocrates and Galen with a combination of both physical and emotional characteristics described as four humors or four temperaments (Galen, trans. 1992; Hippocrates, trans. 1939). Based on his clinical observations of patients' behaviors in the early 1900s, Carl Jung defined two attitudes of temperament: Extroversion and Introversion (Jung, 1921/1971). He conceptualized Extraverted and Introverted qualities as opposite ends of a continuum, noting each person possesses both, however, one also has a preference to display one set of qualities over the other. Jung observed that his patients were most likely to display pathology in a manner consistent with their propensity for temperament qualities. For example, his Extroverted patients more frequently exhibited hysteria or aggression and Introverted patients more frequently exhibited internalizing disorders such as depression or anxiety. Therefore, he posited a balance of temperament qualities with the ability to use either set of qualities when appropriate resulted in better adjustment. His theory also delineates four other basic psychological functions: Sensation/Intuition and Thinking/Feeling. This theory was later modified by Myers, adding a fourth dimension, Judging/Perceiving (Myers & Myers, 1980). Other definitions of temperament have included physiological perspectives such as measures of activity level, distractibility, and reaction intensity for younger children (Thomas & Chess, 1989).

This study is based on the Student Styles Questionnaire (SSQ), a self-report measurement of temperament in the tradition of Jung's theory as related to students' learning style preferences (Oakland, Glutting, & Horton, 1996). Four bipolar temperament dimensions comprise the model: Extroversion-Introversion, Practical-Imaginative, Thinking-Feeling, and Organized-Flexible. All four tempera-

ment dimensions have positive qualities that can represent strengths in the child's learning style.

As temperament dimensions are dichotomous, very strong preferences on one dimension may also identify underdeveloped attributes for the opposing trait that can lead to problem behaviors. Assessment of the child's temperament strengths coupled with a variety of teaching methods that permit all students to utilize their strengths may improve learning and behavior. In addition, it may promote better understanding between educators and students whose styles are very different by providing a non-pathological language for discussion of problem behaviors. Thomas and Chess (1989) described the concept of "Goodness of Fit" in temperament to exist when parents and children either had similar temperaments or the parents had tolerance for the differences. When parents lack an understanding of temperament differences and mandate that children comply with parental styles, conflict can develop (Barkley, 1997; Thomas & Chess, 1989).

### **Extroverted-Introverted Styles**

Extroversion refers to a propensity to draw energy from external sources (e.g., friends and environment) or orient energy outward toward people and events in the external environment. Positive learning style qualities associated with Extroversion include enjoying group discussions, a wide range of topic interests, and a preference for verbal responses (Oakland et al., 1996; Thorne, 1987). If Extroversion is extreme, opposing traits such as respect for others privacy and self-reflection before acting may be underdeveloped. Introverted children renew their energy from within and exert their energy inward (e.g., own ideas/thoughts). Learning style strengths associated with Introversion include in-depth interests, reflective analysis, and preference for written responses. Weaknesses for students with extreme Introversion may include withdrawal, overprotectiveness of personal space, and poor social interaction skills (Myers et al., 1998; Oakland et al., 1996).

Empirical evidence for brain activity differences between Extroverts and Introverts have included studies of cortical arousal, blood flow activity, and select limbic sites. Wilson and Languis (1990) found differences in brain electrical activity with lower cortical arousal for extroverts as compared to introverts. Sternberg (1990) found differences in anterior temporal lobe activity with lower activity for Extroverts. Further support for a biological difference between Extroverts and Introverts is provided by longitudinal studies of differences in measures of limbic sites (Kagan & Snidman, 1991). The higher arousal level for introverts may relate to their inclination to withdraw and seek solitude more often to renew their energy. Shelton's (1996) analysis of stress coping studies indicated hypertension and coronary heart disease was reported one and one-half times more often in introverts compared to what would be expected for their representation in the sample group. On a scale of Emotional Exhaustion, Introverts mean score was significantly higher than that of Extroverts (Maslach, Jackson, & Leiter, 1996). The lower arousal level of extroverts may contribute to their desire to seek external stimulation through increased interactions with others and the environment.

As observed by Jung (1921/1971), persons receiving mental health services with an Extroverted style were noted as more likely to display externalizing disorders and those with an Introverted style to display internalized disorders. When confronted with problems, Extroverts are more likely to first blame others or look to the environment for explanations whereas Introverts are more likely to first become introspective (Myers et al., 1998). Children diagnosed as CD and ODD by nature of their diagnosis display problem behaviors in an externalizing rather than internalized manner. Study of Extroverted children who required counseling for disruptive behaviors noted they are extrapunitive, often punishing others or destroying property in the environment (Myers & McCaulley, 1985). Those preferring Introversion were often intrapunitive or self-punishing and engaged in self-destructive behaviors. Symptoms for CD and ODD both involve extrapunitive problematic behaviors (e.g., opposi-

tion, arguing, and fighting), however, behaviors of CD children are more severe and chronic than those with ODD and therefore, a stronger preference for Extroversion would be anticipated. Aggressive children also tend to be more attentive to their external environment and display negative attributional bias to the behaviors of others (Dodge & Newman, 1981).

### **Practical-Imaginative Styles**

The Practical-Imaginative dimension refers to one's preferences for acquiring and assessing new information. The Practical style includes a pragmatic approach that enjoys learning facts in a linear, sequential manner with applications first through hands-on experience (Beyler & Schmeck, 1992). They often interpret information in a literal manner with an emphasis on current events and facts (Myers et al., 1998). Harrison and Lawrence (1985) found when asked to write essays about their personal future, Practical students time orientation had a shorter frame of reference with a linear emphasis on the present, whereas Imaginative orientation was longer and looked toward the future. For a child with a very strong Practical orientation, skills typical of Imaginative styles (e.g., ability to generalize global concepts or guidelines, and ability to recognize patterns predicting consequences) may be underdeveloped. Imaginative style is associated with a preference for learning concepts first through study of theory and intuitive insight, then generalization to applications. Weaknesses for these students may include inattention to detail and overlooking practical issues related to real-world applications (Oakland et al., 1996).

Children with CD and ODD often exhibit behaviors that reflect a tendency toward the weaknesses of Practical rather than Imaginative styles. For example, their rigid attitudes, narrow focus on present issues, and failure to consider long-term consequences of behaviors (Oakland et al., 1996). They can become easily annoyed and argumentative when directions are not explicit or when people do not meet their expectations. For example, they are often argumentative over the literal interpretation of rules (Frick, 1998) and unwilling to compromise or value others' point of view. In addition, they do not generalize the intent or premise of rules well to other situations. Newman (1979) and DiTiberio (1977) found those with a preference for Practical styles were less adept at identifying implied meanings and recognizing covert feeling messages. Parental behavior management training that utilizes the preferences of a Practical orientation, such as providing very explicit rules and well delineated sequential consequences has been helpful in changing defiant behaviors (Barkley, 1997).

The qualities of Imaginative students may be well suited to learning in present educational settings as they are overrepresented among gifted students (Oakland, Joyce, Glutting, & Horton, 2000) and the highest achievers, especially in college (Myers & McCaulley, 1985). In comparisons of intelligence, SAT, and GRE scores, Imaginative children were consistently higher (Myers, 1962; Myers & McCaulley 1985). Students with the combined qualities of Introversion, Imaginative, and Organized have among the highest GPAs and graduation rates (Myers & Myers, 1980).

Although research is limited, there is some physiological evidence of differences in EEGs between persons preferring Practical and Imaginative Styles (Newman, 1985). Those with a preference for Practical qualities had greater activity in the left hemisphere and those with a preference for Imaginative styles had greater activity in the right hemisphere. In addition, persons with a Practical style are over-represented in research on stress and self-reported hypertension and coronary heart disease (Shelton, 1996).

### **Thinking-Feeling Styles**

Thinking-Feeling style refers to how one makes decisions. Learning style strengths associated with a Thinking preference include a strong concern for justice, logic, and a quizzical nature. Weak-

nesses may include over emphasis on competitiveness, abrupt opinions, discomfort expressing feelings, and less sensitivity to the feelings of others (Oakland et al., 1996). Children with CD and ODD often exhibit blunt verbal interactions and initiate debate in provoking or responding to conflict. Thus, those with ODD and CD as well as those with a Thinking preference are more likely inclined to directly confront disagreements rather than exert diplomacy or seek harmony.

Numerous research studies have found males in the general population prefer a Thinking style and females generally prefer a Feeling style. Approximately 65% of males prefer Thinking and 72% of females prefer Feeling (Myers et al., 1998; Oakland et al., 1996). The majority of persons with CD and ODD are males; therefore, it is hypothesized in this study that CD/ODD students would have high scores on Thinking styles.

Those with a Feeling preference make decisions with an emphasis on harmony, sympathy, and diplomacy. However, when overly concerned with avoiding conflict, students with a strong Feeling style may lack appropriate application of critical thinking and open expression of opinions (Oakland et al., 1996). Given their preference for a Feeling style, females may be inclined toward internalizing disorders (e.g., depression) while males may be inclined toward externalizing disorders (e.g. ODD, CD, disruptive behaviors). For example, in most cultures physical aggression is more common among males (Rosenzweig, Leiman, & Breedlove, 1996) and incidents of depression are more common among females (APA, 1994).

### **Organized-Flexible Styles**

The Organized-Flexible dimension refers to when one makes decisions. Organized children prefer planning, routine, and impose systems to maintain order. Students with this preference report a stronger goal orientation (Atman, 1993). Underdeveloped traits associated with stronger Organized preferences may include flexibility, tolerance, and adaptation to change. The strengths of students with a preference toward Flexible styles include embracing change, spontaneity, and desire for variety. Their weaknesses can include organization skills and compliance (Oakland et al., 1996). Children with CD and ODD often display less compliance to classroom structure and self-control. For example, they lose their temper, blame others for their misfortunes, argue, defy rules, neglect to follow procedures, and dislike externally imposed regulations.

Weaknesses on each temperament dimension are associated with more extreme preferences that result in underdevelopment of the opposing traits. Children with ODD and CD exhibit many of the weaknesses associated with strong Extroversion, Practical, Thinking, and Flexible learning styles (Oakland et al., 1996). Because children with CD exhibit more chronic and severe behavioral problems, it was hypothesized children with CD would have stronger preferences than those with ODD for the Extroversion, Practical, Thinking, and Flexible styles. In addition to strength of preference, it was also predicted a larger ratio of students with CD or ODD would prefer Extroversion, Practical, Thinking and Flexible styles than is typically found in the general population of students. The rates of student preferences are well-documented in temperament literature and were used for comparison.

## **METHOD**

### **Participants**

Eighty children and youth ages 8 to 17 served as participants: 40 (37 males; 26 Caucasian, 12 African American, 2 Hispanic) had a current diagnosis of Oppositional Defiant Disorder, and 40 (31 males; 28 White and 12 African American) had a current diagnosis of Conduct Disorder. Diagnoses were based on DSM-IV criteria and made by psychologists, psychiatrists, and/or school psychologists.

In addition, documentation was verified with the child's medical, judicial, or school records. Participants were recruited while receiving self-contained services in local alternative schools, adjudicated youth-juvenile justice programs, and an adolescent psychiatric unit. All SSQ data were collected from participants in their respective intervention settings by the first author.

### **Measure**

The Student Styles Questionnaire (SSQ), a self-report measure of temperament (Oakland et al., 1996), was administered to all participants in this study. The instrument's 69 dichotomous forced-choice questions elicit information on children's preference on one of four bi-polar temperament qualities: Extroversion-Introversion, Practical-Imaginative, Thinking-Feeling, and Organized-Flexible. The standardization sample for the SSQ (7,902 students) was drawn to be representative of the 1990 U.S. Bureau of the Census data.

The SSQ manual reports reliability estimates were examined by administering the test twice with a seven-month interval to 137 students. Test-retest reliability coefficients for the SSQ range from .67 on the Practical-Imaginative dimensions to .80 on the Extroversion-Introversion measures. The average test-retest reliability is .74 (Oakland et al., 1996).

Internal validity for the instrument was established by expert consensus, factor analysis, and item analysis methods. Convergent validity studies included the Myers-Briggs Type Indicator (MBTI; Myers & McCaulley, 1985) and the Values Inventory (VI; Oakland et al., 1996). Analysis of relationships between the MBTI and the SSQ indicated significant correlations on similar dimensions. Univariate correlations between the subscales of the VI and SSQ also were significant. The SSQ's construct validity is highly similar for children of various ages, for both boys and girls, and for children from the three racial-ethnic groups on which it was standardized (i.e., African American, Hispanics, and Caucasian). Item response patterns also are similar for children from these groups (Stafford & Oakland, 1996).

### **Procedures**

The SSQ data for this study were coded in two ways. First the data set was reviewed to determine the *T*-score for each temperament dimension. Secondly the learning style preference on each dimension (e.g., Extroverted or Introverted) was established to categorize participants into one of the two bipolar dimensions. High *T*-scores are associated with Extroversion, Practical, Thinking, and Organized subscales. Low *T*-scores are associated with Introversion, Imaginative, Feeling, and Flexible subscales.

*Statistical analysis of T-scores.* Children with CD display more chronic and severe behavior problems than children with ODD, thus their temperament preferences were hypothesized to be more extreme. Pathology is more likely to be displayed when temperament preferences are very strong (i.e., *T*-scores on one end of continuum) because the opposing qualities on that temperament dimension are less developed. Therefore, *T*-score data were analyzed to determine mean group differences on each temperament dimension scale.

Norming data from the SSQ manual indicates the subscales are relatively independent with factor intercorrelations ranging from  $r = -0.30$  to  $r = .24$  between the Practical Imaginative scale and the Organized-Flexible scale (Oakland et al., 1996), therefore, MANOVA correlation was conducted in this study. However, because MANOVA is a very conservative estimate of significance (i.e., applies .05 *p* value across all four variables) additional Analyses of Variance (ANOVA) were also conducted on each dimension.

*Statistical analysis of frequency.* Children with CD and ODD display a number of Extroverted, Practical, Thinking, and Flexible traits in their problem behaviors. For example, they externalize aggression/blaming, they can have rigid attitudes focused primarily on the present, they are inclined to arguing and direct confrontation, and they resist compliance to classroom structure. In addition, traits of the opposing learning styles (i.e., Introversion, Imaginative, Feeling, and Organized) appear underdeveloped. Therefore, both children with CD and ODD were hypothesized to express a preference for Extroverted, Practical, Thinking, and Flexible styles more frequently than typically found in the general population. Chi-square analyses was used to test these hypotheses.

The data set was analyzed by chi square analysis for proportion/frequency of each temperament dimension. This method is used commonly with temperament data (Myers & McCaulley, 1985; Myers et al., 1998). Chi-square normally sets default values evenly for each cell (e.g., 50% Extroverted, 50% Introverted). However, there is a large body of research over several decades that have consistently established the percentages each temperament dimension occurs are not evenly distributed in the general population (Myers & McCaulley 1985; Oakland et al., 1996). Therefore the preference frequency on each temperament dimension for students with CD or ODD was compared against set expected cell values established in the general population. These percentages are available in Table 2. On the Thinking-Feeling dimension, the small sample sizes for females with CD and ODD ( $n=12$ ) precluded reliable analyses. Thus, Chi-square analyses on the Thinking-Feeling dimension consider data only for boys.

## RESULTS

MANOVA comparison of all four temperament dimensions was not significant, Wilk's Lambda,  $F(4, 75) = 1.843, p = .129$ . Because the MANOVA is a very conservative estimate of significance (i.e., applies .05  $p$  value across all four variables) ANOVA analyses were conducted for each temperament dimension. Descriptive data for children with CD and ODD on the four temperament dimensions are reported in Tables 1 and 2.

**Table 1.**  
*Temperament Means and Standard Deviations*

	CD		ODD	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Extroversion-Introversion	54.3	14.3	56.5	9.5
Practical-Imaginative	65.2	11.4	70.4	7.6
Thinking-Feeling	57.0	9.5	58.4	10.0
Organized-Flexible	46.8	10.4	47.0	7.7

*Note.* CD = Conduct Disorder, ODD = Oppositional Defiant Disorder, Extroversion/Introversion and Thinking/Feeling dimensions,  $T$ -scores  $> 50$  = Extroverted and Thinking;  $T$ -scores  $< 50$  = Introverted and Feeling. On the Practical/Imaginative dimension  $T$ -scores  $> 60$  = Practical and  $T$ -scores  $< 60$  = Imaginative. On the Organized/ Flexible dimension,  $T$ -scores  $> 47$  = Organized and  $T$ -scores  $< 47$  = Flexible.

**Table 2.**  
**Temperament Preference Percentages - Students With CD/ODD and General Population**

	E	I	P	M	T	F	O	L
CD	65%	35%	70%	30%	68%	32%	55%	45%
ODD	78%	22%	98%	2%	80%	20%	43%	57%
CD/ODD Total	71%	29%	84%	16%	74%	26%	49%	51%
	E	I	P	M	T	F	O	L
General Population	65%	35%	65%	35%	50%	50%	50%	50%
General Males	66%	34%	67%	33%	64%	36%	42%	58%
General Females	64%	36%	64%	36%	28%	72%	59%	41%

*Note.* CD = Conduct Disorder, ODD = Oppositional Defiant Disorder, E = Extroverted, I = Introverted, P = Practical, M = Imaginative, T = Thinking, F = Feeling, O = Organized, L = Flexible.  
*Source.* Keirsey and Bates (1978) and Oakland, Glutting, and Horton (1996).

#### **Extroversion-Introversion Styles**

*T*-score differences on Extroversion and Introversion styles between children with CD or ODD were not significant,  $F(1, 78) = .675, p = .414$ . The frequency did not differ between children with CD or ODD who express a preference for Extroversion or Introversion, CD,  $\chi^2 = .000, p < 1.00$ ; ODD,  $\chi^2 = 2.747, p < .097$ , and the rates typically found in the general population. The preference rate for the general population is 65% Extroverted and 35% Introverted (Oakland et al., 1996).

#### **Practical-Imaginative Styles**

*T*-score differences on Practical and Imaginative styles between children with CD and ODD were significant,  $F(1, 78) = 5.805, p = .018$ . Compared to children with CD, children with ODD expressed a stronger preference for Practical styles. The frequency of children with CD who expressed a preference for Practical and Imaginative styles and preference rates typically found in the general population was not significant, CD,  $\chi^2 = .440, p < .507$ . In contrast, differences between children with ODD and the general population were significant, ODD,  $\chi^2 = 18.571, p < .000$ , with ODD children more likely to express a preference for Practical styles. The preference rate for the general population is 65% Practical and 35% Imaginative (Oakland et al., 1996).

#### **Thinking-Feeling Styles**

*T*-score difference on Thinking and Feeling styles between children with CD and ODD were not significant,  $F(1, 78) = .428, p = .515$ . Differences between male children with CD and the typical preference rates for the general population were not significant, CD,  $\chi^2 = 1.067, p < .302$ . In contrast, differences between male children with ODD and the general population were significant, ODD,  $\chi^2 = 6.905, p < .009$ , indicating children with ODD are more likely to express a preference for Thinking styles than children in the general population. The preference rate for the general population is 64% Thinking and 36% Feeling (Oakland et al., 1996).

#### **Organized-Flexible Styles**

*T*-score differences on Organized and Flexible styles between children with CD or ODD were not significant,  $F(1, 78) = .005, p = .942$ . The frequency of children with CD or ODD who express a

preference for Organized or Flexible did not differ between them and the preference rates found in the general population, CD,  $\chi^2 = .400, p < .527$ ; ODD  $\chi^2 = .900, p < .343$ . The preference rate for the general population is 50% Organized and 50% Flexible (Oakland et al., 1996).

## DISCUSSION

All temperament styles have positive strengths and the potential for underdeveloped opposing qualities. Understanding learning style preferences can provide a non-pathological framework for acknowledging children's strengths and identifying qualities that require remediation. As Jung (1921/1971) noted, this perspective strives to develop a balance of traits for better adjustment.

Differences in temperament learning styles have been identified for academic persistence, graduation (Schurr et al., 1997), giftedness (Oakland et al., 2000), and achievement (Myers et al., 1998). Research indicates consideration of learning styles can impact positive affective regard for teachers (Cornett, 1983), lower therapy dropout rates, and increase therapy duration (Myers et al., 1998). Using a Goodness-of-Fit concept, some successful ODD remediation programs include parental education in temperament differences to increase both tolerance and understanding of differences and thus lower child/adult conflicts (Barkley, 1997).

Temperament-based learning style data were analyzed for strength of preference between children with CD and ODD as well as for frequency of preference between CD, ODD, and well-documented frequency rates in the general population. When comparing the strength of learning style preferences for children with CD or ODD results were not significant on three temperament dimensions: Extroversion-Introversion, Thinking-Feeling, or Organized-Flexible. However, a significant difference was noted for Practical-Imaginative with ODD children having a stronger preference for Practical qualities. Analysis of frequency of preference indicated a significant difference in the number of ODD children for Practical (98% ODD, 65% in general population) and Thinking (68% CD, 80% ODD, 64% in general population of males) styles only.

### Practical Style

The finding that 98% of children with ODD expressed a Practical style preference is especially noteworthy and this has implications in several areas: teaching methods, communication, and behavioral intervention. Practical students generally prefer teaching methods that include hands-on experiences (e.g., experiments and manipulation) that utilize all their senses as opposed to more sedentary methods (e.g., lecture or reading). However, the latter methods are more common in schools (Myers & McCaulley, 1985). In general, alternative schools that offer vocational training utilize these hands-on learning styles. A preference for Practical learning style by both teachers and students has been found in three studies of vocational education programs (Barrett, 1989; Johnson, Zimmerman, & Brooker, 1994; Vollbrecht, 1991). Persons who prefer Practical styles are attentive to detail, and form a literal understanding as opposed to generalized theoretical concepts (Oakland et al., 1996).

With their preference for sequential, linear, and concrete information, Practical students may be at particular risk for misinterpreting expectations that are general or vague. Patterson (1982) found an inability to communicate clear behavior expectations and consequences to be the one common factor among parents of children with behavioral disorders. The need for explicit behavioral expectations with specific consequences often is vital for children with a preference for concrete terms, simplicity, and detail. The stronger preference of children with ODD for Practical styles also may help explain why parenting programs that emphasize succinct sequential communication of expectations have been helpful in changing their defiant behaviors (Barkley, 1997; Patterson, 1982).

With a strong preference for Practical styles, the opposing characteristics of Imaginative styles (e.g., generalizing concepts to multiple situations and analysis of long-term effects) may be underdeveloped and therefore helpful to remediate. For example, the temperament preferences of the majority of children with CD/ODD for Practical styles may help explain why they do not generalize the principles of rules well to multiple situations. Behavioral interventions that utilize their strengths (e.g., hands-on activities when teaching social skills and real-world explanations for rules) may be most productive in creating positive change.

### **Thinking Styles**

Children with ODD exhibit many conduct problems consistent with the weaknesses of stronger Thinking style (e.g., blunt opinions and arguing). In addition, children who are aggressive tend to have a negative attributions bias (Dodge & Newman, 1981). This propensity to interpret interactions in a hostile manner coupled with an inclination to blunt, critical opinions may further escalate their defiance and arguing behaviors. Thus, children with ODD may benefit from teaching strategies that recognize Thinking strengths (e.g., logical analysis, critical thinking, and direct feedback), yet remediate the opposing Feeling skills (e.g., diplomacy, empathy, and consensus) (Oakland et al., 1996). Their preference for Thinking styles may explain why children with CD and ODD benefit from social skills training programs designed to improve their listening skills and sensitivity, qualities commonly attributed to Feeling styles.

## **LIMITATIONS**

Several study issues warrant consideration when examining temperament preferences of children with CD or ODD. These include low incidence of females, the age range of participants, differences in severity of behaviors, and univariate comparison limitations. The majority of participants in this study were males; therefore, findings may not represent the preferences of females given a larger female sample. Participants ranged in age from 8 to 17 and the sample size did not permit reliable analysis by age, which has implications for long-term chronic versus short-term disruptive behaviors. In addition, there is a wide spectrum of behaviors within ODD and CD ranging from mild to severe (e.g., arguing versus cruelty to people). The participants in this study were all participating in self-contained programs with extensive disruptive behavior histories. Therefore, these results may be best representative of CD/ODD children with more chronic and severe behavioral problems. MANOVA comparison of all four temperament dimensions in this study was not significant. However, because the MANOVA is a very conservative estimate of significance (i.e., applies .05 *p* value across all four variables) further univariate analyses was also conducted. Although some univariate comparisons were significant, this procedure increases the likelihood of Type I error.

## **SUMMARY**

In summary, the primary findings of this study indicate students with ODD expressed a significantly stronger preference for Practical versus Imaginative learning styles. In addition, significantly more students with ODD as compared to those with CD expressed a preference for Practical and Thinking styles. All temperament styles have positive strengths and the potential for underdeveloped opposing qualities. In particular, students with a preference for Practical and Thinking styles have strengths in their ability to learn from hands-on experiences, factual detail, sequential/linear formats, critical analysis, and direct feedback. Encouraging teachers to include these methods may offer more opportunities for students with ODD to succeed. Potential weaknesses for students with strong Practi-

cal and Thinking learning styles include a poor ability to generalize concepts and rules to varying situations, bluntness, and being argumentative. Recommending interventions strategies that develop opposing qualities of the Imaginative and Feeling learning styles (e.g., sensitivity, social skills training, and ability to generalize rules) may help remediate negative behavior (Oakland et al., 1996). The perspective of including temperament qualities in assessment and intervention strives to acknowledge students' strengths and weaknesses in a non-pathological framework that promotes a balance of traits for better student adjustment.

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