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Differing in Residential Status:
Resource and Trait Theory Perspectives

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**RORSCHACH RESPONSES IN OLDER ADULTS DIFFERING IN RESIDENTIAL
STATUS: RESOURCE AND TRAIT THEORY PERSPECTIVES**

By

Lidia Ann Domitrovic

A DISSERTATION

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ABSTRACT

RORSCHACH RESPONSES IN OLDER ADULTS DIFFERING IN RESIDENTIAL STATUS: RESOURCE AND TRAIT THEORY PERSPECTIVES

BY

LIDIA ANN DOMITROVIC

Rorschach responses are the product of cognitive processes influenced by the underlying personality dynamics of the individual. Age-related changes in Rorschach responding have been well-documented, as have performance declines on numerous cognitive tasks. Resource theory posits that age-associated decrements in information processing may account for these cognitive differences. This study examined Rorschach responses in older adults differing in residential status in light of both Resource theory and the five-factor model of personality (Costa & McCrae, 1992).

Forty community-dwellers and forty care facility residents who had sufficient sensory and motor abilities to complete all tasks independently, and who passed mental status criteria, participated. The Digit Symbol Substitution subtest of the Wechsler Adult Intelligence Scale - Revised served as the measure of information processing; personality was assessed with the NEO-FFI. Each participant was administered the Rorschach and selected measures of general cognition and depression. Differences in personality attributes as a function of residential status were not expected, but it was predicted that community-dwellers would process information more rapidly. It was also hypothesized that faster information processing rates, higher scores on the

personality domains of Openness to Experience, Agreeableness, and Extraversion, and lower scores on Neuroticism, would be associated with more productive and higher quality Rorschach protocols.

Residents of care facilities were slower information processors than community-dwellers, as predicted. Rorschach performance did not differ as a result of residential status, when age and health status were controlled. Information processing rate and Openness, both together ($r = .58$) and independently ($sr = .42$ and $.26$, respectively), accounted for a significant proportion of the variance in a General Response Process factor variable primarily composed of R , P , and M . Agreeableness was found to be a significant predictor of scores on a Perceptual Accuracy Factor ($r = .29$) principally defined by $F+\%$, $X+\%$, and $X-\%$. Openness was significantly associated with a factor variable representing Holistic Integration ($r = .28$) characterized principally by W and Zf . The results suggest that information processing rate and certain personality factors influence at least some aspects of Rorschach response formation in older adults.

For my parents, Helen and Vince Domitrovic

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TABLE OF CONTENTS

List of Tables	viii
List of Figures	x
Introduction	1
Literature Review	4
Rorschach Responses In Older Adults	4
Historical Conclusions	4
Methodological and Interpretive Issues	5
Contemporary Considerations and Findings	7
Resource Theory and the Rorschach	9
Theoretical Tenets and Findings	9
Influence on the Rorschach	11
Trait Theory and the Rorschach	13
Personality Findings	13
A Trait Theory Perspective	16
Residential Status and Older Adults	19
The Residential Care Population: General	
Characteristics	19
Mental Health Issues	20
Psychological Effects of Residential Status	23
Further Considerations	27
Methods	28
Participants	28
Procedure	29
Tests and Measures	30
Digit-Symbol Substitution Subtest, WAIS-R	30
Exner Comprehensive System for the Rorschach	31
Geriatric Depression Scaled (GDS)	32
Mini Mental Status Exam (MMSE)	32
NEO Five-Factor Inventory (NEO-FFI)	33
Reading Subtest, WRAT-3	33
Scoring	34

Hypotheses and Data Analysis	35
Results	39
Sample Selection and Response Rate	39
Descriptive Statistics	41
Demographic Data	41
Cognitive and Information Processing Measures	48
Personality Variables	50
Rorschach Responses	53
Relationships Between Variables: Statistical Analyses	60
Relationships Among Information Processing Rate, Mood, and Demographics	60
Rorschach Variables and Information Processing Rate	61
Rorschach Performance, Information Processing and Personality	64
Additional Analyses	70
Discussion	73
Sample Selection and Response Rate	73
Demographic Variables	76
Depression	80
Information Processing Rate and Cognition	81
Personality	83
Rorschach Performance	85
Relationships Between Variables	88
Information Processing Rate, Mood, and Demographics	88
Rorschach Variables and Information Processing Rate	91
Rorschach Variables and Personality	93
Rorschach Performance, Information Processing and Personality	97
Further Considerations	100
Methodological Issues	101
Final Considerations	102
References	106
Appendix A: Consent Form	128
Appendix B: Rorschach Determinants: Exner's (1990) Normative Values for 700 Nonpatient Adults	129

LIST OF TABLES

Table 1:	Residential and Gender Differences in Age and Education	42
Table 2:	Residential Differences in Medical History	44
Table 3:	Frequency of Diagnostic Category	45
Table 4:	Residential Differences in Information Processing Rate and Cognition	49
Table 5:	Intercorrelations Between Cognitive Measures	50
Table 6:	NEO-FFI Descriptive Data	51
Table 7:	Gender Differences in Personality Domains	52
Table 8:	Intercorrelations Among Personality Domains	53
Table 9:	Rorschach Determinants: Descriptive Data	54
Table 10:	Residential Status Differences in Rorschach Determinants	55
Table 11:	Rorschach Determinants: Normative Versus Sample Differences	56
Table 12:	Intercorrelations Between Standardized Rorschach Variables	58
Table 13:	Factor Pattern Matrix (Promax Solution) for Rorschach Variables	59
Table 14:	Intercorrelations Among Rorschach Factor Variables	59

Table 15:	Regression: Rorschach ACC on Personality Variables	63
Table 16:	Regression: Rorschach ORG on Personality Variables	63
Table 17:	Regression: Rorschach RSP on Personality Variables	64
Table 18:	Regression: ACC on the Information Processing - Personality Interaction	65
Table 19:	Regression: ACC on Information Processing and Personality - Main Effects	66
Table 20:	Regression: ORG on the Information Processing - Personality Interaction	67
Table 21:	Regression: ORG on Information Processing and Personality - Main Effects	68
Table 22:	Regression: RSP on the Information Processing - Personality Interaction	69
Table 23:	Regression: RSP on Information Processing and Personality - Main Effects	70
Table 24:	Rorschach Performance and Selected Demographics: Correlations	71

LIST OF FIGURES

Figure 1:	Proposed Model of Variable Interaction	37
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RORSCHACH RESPONSES IN OLDER ADULTS DIFFERING IN RESIDENTIAL STATUS: RESOURCE AND TRAIT THEORY PERSPECTIVES

INTRODUCTION

The Rorschach Inkblot method (Rorschach, 1942) is one of the most popular and common techniques employed in the psychological assessment of adults across diverse clinical settings (Piotrowski & Keller, 1989; Sweeney, Clarkin, & Fitzgibbon, 1987). Yet, to date, it has generally been dismissed as an effective assessment measure with older adults, no doubt because the research concerning the Rorschach response process in this population has been equivocal (La Rue, 1992; Scogin, 1994). Our lack of knowledge in this regard is unfortunate, and needs to be remedied for two reasons: (a) The population of persons 65 years of age or older is rapidly growing and will represent 17% of the U.S. population by the turn of the century (Albert, 1988), and (b) the biological and social facets of aging, which include physiological changes, increased risk for chronic diseases (especially dementia), and role changes and/or loss, can impact psychological factors such as subjective well-being, mood, and coping skills (La Rue, 1992; Wiggins, 1994). The net effect: an ever-growing segment of the population requiring accurate assessment and treatment of the sequelae associated with the biopsychosocial challenges of aging, demanding, in turn, an accurate understanding of how those challenges may manifest on assessment tools such as the Rorschach.

Rorschach responses are the product of perceptual and cognitive processes influenced by the underlying personality dynamics of the individual - in sum, a result of both perception and representation (Blatt, 1990; Rapaport, Gill, & Schafer, 1968, chap. 9; Weiner, 1986). Changes in cognitive functioning with advanced age have been well-documented (Salthouse, 1985; 1991, 1992a). Recent evidence has suggested that reduced rates of information processing within the central nervous system can explain the performance decrements of older adults, relative to younger adults, on a number of cognitive tasks (Cerella, 1985; Salthouse, 1991, 1992a). The present study examined the Rorschach response process in older adults, living in both the community and in residential care facilities, within the context of resource theory, which postulates a decline in the resource of time with increasing age (Salthouse, 1985). Specifically, limitations in the rate of processing information as manifested on both a standard cognitive task and on the Rorschach response process were investigated. As noted by both Kahana (1978) and Hayslip (1981), there is a need for research on the factors that uniquely influence the response process in the elderly.

The mechanism of response formation, however, suggests that potential age effects could arise not only at the level of perception, but at the level of representation, or as a result of the interaction of these two processes. While the accumulated evidence suggests that the five most commonly replicated personality domains of Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness remain stable with age (Costa et al.,

1986; Costa & McCrae, 1980, 1992; Costa, Metter, & McCrae, 1994), information regarding how these constructs may mediate the Rorschach response process is unknown. Thus, Rorschach responses were also investigated in the context of trait theory, so that the influence of personality factors, as well their potential interaction with reduced processing resources, could be examined in older adults.

Including a sample of older adults residing in long-term care facilities was of interest for several reasons. The most extensive investigations of Rorschach responses in the elderly (Ames, 1960, 1966, 1974; Ames, Mettraux, Rodell, & Walker, 1973), which were conducted with both community-dwelling and institutionalized older adults, have never been replicated. This is problematic because, for years, these atheoretical, and often methodologically flawed studies, were touted as classics in the field (Peterson, 1991). Given that: (a) The population of adults 65 years and older who reside in care facilities is rapidly growing (Streim & Katz, 1996), (b) the lifetime risk of at least temporary placement is anywhere from 25% to 50% (Campion, Ban, & May, 1983; McConnel, 1984), and (c) substantial mental health needs, demanding accurate assessment, management, and treatment, exist in this population (Streim, Rovner, & Katz, 1996; Tariot, Podgorski, Blazina, & Leibovici, 1993), a contemporary, theoretical re-examination of the Rorschach was long overdue.

The Digit Symbol Substitution subtest of the Wechsler Adult Intelligence Scale - Revised (WAIS-R) provided a measure of information processing rate,

while personality dimensions were assessed with the NEO-FFI. Although community-dwelling older adults do not necessarily suffer from a greater frequency of depression relative to their younger counterparts (Myers et al., 1984), depressive disorders are the second most common psychiatric diagnosis in residential care facilities (Streim & Katz, 1996). Since depression can influence both information processing rate (Kaszniak & Ditraglia Christenson, 1994; La Rue, 1992) and the content of Rorschach protocols (Exner, 1986), level of depressive symptomatology was also assessed by a self-report measure. Rorschach protocols were scored with the Exner Comprehensive System (1986), the most widely and rigorously studied scoring and interpretive system available.

LITERATURE REVIEW

Rorschach Responses in Older Adults

Historical Conclusions

Early investigations of the Rorschach with older adults tended to support Rorschach's (1942) hypothesis that normal aging was associated with the following "pathognomic" signs: (a) a reduced ability to utilize inner resources and weaker reactions to emotional stimuli as represented by a decrease in human movement responses relative to chromatic color responses, (b) a decrease in perceptual acuity and intellectual efficiency as represented by vague or poorly envisioned percepts, and (c) a marked response stereotypy, presumably demonstrating a narrowing of interests. The majority of the studies were

conducted prior to the original publication of Exner's Comprehensive System (1974/1986), a strategy for scoring and interpreting the Rorschach which evolved from the best aspects of the five extant systems in common use prior to 1957. In many of the studies, information regarding administration, scoring, and the nature of any normative data used in comparisons were not offered; nonetheless, a very crude comparison of the results is possible because many of the determinants reported had similar meanings across systems. Thus, in reviewing the flurry of literature largely published during the 1950's and 60's, Reichlin (1984) found that the Rorschach protocols of older adults were typified by fewer total responses (*R*), increased reaction times, elevations in the number of responses formed by global stimulus perception (*W*%), and increases in animal content (*A*%). An increase in responses determined solely by the form or contour of the blots was noted (*F*%), but was accompanied by a concomitant decrease in the quality of those forms (i.e., lower *F*+%). Lastly, fewer of the responses were those commonly perceived by younger adults (Popular or *P*%), and fewer responses were determined by human-like activity or movement (*M*). Overall, a decline and constriction of cognitive resources with increasing age was suggested by the Rorschach protocols of the older adults so examined (Panek, Wagner, & Kennedy-Zwergel, 1983; Prados & Fried, 1947).

Methodological and Interpretive Issues

The studies were plagued, however, by methodological difficulties. Klopfer (1946) collapsed his sample of 30 community-dwelling and 20 nursing

home residents when making conclusions regarding the healthy elderly, even though there was evidence of severe psychopathology in the latter. The same institution provided the sample studied by Davidson and Kruglov (1952), who, in addition to replicating Klopfer's results, observed: (a) an inability to name or identify the percept; (b) identification of the percept by its function, rather than by name; (c) identification of what the blot was not; and (d) immediate rejection of a given response. Note, however, that the latter four behaviors are frequently observed on the Rorschach protocols of persons with brain damage (see Goldfried, Stricker, & Weiner [Chapter 11], 1971, for a review). Indeed, the changes in the Rorschach variables of reaction time, total *R*, *M*, and *P*%, traditionally posited to be associated with increasing age, have been long observed in the protocols of neurologically impaired persons (Hughes, 1948; Piotrowski, 1936, 1940). Modern research utilizing the Exner system to score the Rorschach protocols of persons with neurologic disease and/or injury has found changes in the aforementioned variables, as well as in scores (*F*+, *X*+, and *X*-) addressing the perceptual accuracy of form dominated responses (Ellis & Zahn, 1985; Perry, Potterat, Auslander, Kaplan, & Jeste, 1996).

Caldwell's (1954) study of 47 institutionalized women falling in the age ranges between 61-75 and 76-92 found the typical pattern of results identified by Reichlin's (1984) review and observed by Klopfer (1946), and Davidson and Kruglov (1952); computed correlations between age and Rorschach determinants, however, reached statistical significance only for the variables of

M and the number of good original responses (*O*+), a determinant no longer in use in the Exner system. Taking a cue from Caldwell's conclusions that Rorschach differences with age might be a result of unidentified factors which may have next to no relationship with age, Ames and her colleagues conducted extensive studies of the Rorschach response process in older adults (1960, 1966, 1974; Ames et al., 1973). Following participants longitudinally, collecting information regarding education and employment history, dividing groups by cognitive capacity into presenile and senile (although on the basis of Rorschach performance itself), and evaluating the effects of residential status, afforded the authors the opportunity to observe that poorer quality Rorschach responses (i.e. increases in *F*%, *F*-%, and *A*%) were more related to demographic factors, such as low SES, institutionalization, and intellectual capacity, than to age itself. Similarly, measured intelligence on the Wechsler Adult intelligence Scale was the most significant predictor of Rorschach response quality in a sample of community-dwelling older adults (Eisdorfer, 1963).

Contemporary Considerations and Findings

Despite increased methodological sophistication, contemporary studies have tended to generally replicate the equivocal findings found in the older research. In a sample of healthy, non-demented, elderly Finnish followed longitudinally over 10 years, no changes were found in *F*+%, *P*%, or animal movement with advancing age (Mattlar, Knuts, & Virtanen, 1985). Yet, Shimonaka and Nakazato (1991) found age-related changes in total response

number, *P*%, shading determinants, rejection of blots, poor form quality (*F*-%), and content range in their 10 year longitudinal study of 52 healthy Japanese with an average age 76 at study initiation. These results, which were scored and interpreted according to the Klopfer system, led the authors to conclude that advancing age is associated with decreases in productive and creative thinking, cooperativeness, and interest in society. In contrast, Gross, Newton, and Brooks (1990), scoring the protocols of a healthy, community-dwelling, American sample according to the Exner (1986) System, found that older adults with higher IQ scores tended to produce more active Human Movement (*Ma*) responses than the older adults with lower IQ scores. No differences were found with increasing age in the other determinants in this study, which controlled for the potentially moderating effects of IQ, sex, depression level, and medication amount on Rorschach responses.

Gross et al. (1990) also screened study participants for auditory and visual deficits to control for any possible effects due to the sensory decrements which frequently accompany old age (see Fozard, 1990, for a review). Klopfer (1974) argued that the characteristically vague perceptions of older adults were due to their inability to see them clearly. Eisdorfer (1960a, 1960b), however, provided evidence that, as long as vision is corrected, Rorschach responses should not be compromised by normal visual changes, even in those adults with extremely poor vision.

The increased consideration of demographic and physiological factors which evolved within this research tradition should be noted. It does appear that many of the so called age effects found in the early studies were largely a result of unidentified (or ignored) dementing processes; indeed, studies investigating Rorschach responses among the healthy elderly and those classified as demented on the basis of other measures, found that the two groups could be distinguished on the basis of determinants such as $F+\%$, $A\%$, and $P\%$ (Insua & Loza, 1986; Kettell, 1976). But little can be confidently stated about the response process in older adults facing the normal, rather than the pathological, challenges of aging. The differing Rorschach methodologies employed across studies, as well as the potential for cultural variability introduced by the contemporary investigations of Japanese and Finnish populations, have proven to be less than illuminating, the only seeming commonality across studies represented by a proclivity to atheoretical research. Indeed, some authors have insisted that the only conclusion that can be drawn from the accumulated work is that "extreme caution" should be used in making clinical use of the Rorschach with older adults (Hayslip & Lowman, 1986; Scogin, 1994).

Resource Theory and the Rorschach

Theoretical Tenets and Findings

A truism in the geriatric literature was nicely summarized by Sharps, who stated that, "Cognitive declines with age have been documented so thoroughly that few investigators question their existence or importance" (1990, p. 298).

Resource theory, which addresses this issue, was the formal appellation applied by Salthouse (1985, 1991) to "...the belief that age differences in certain cognitive tasks are not due to impairments in task-specific components or strategies, but instead are at least partially attributable to an age-related reduction in the quantity of some type of general-purpose processing resource considered necessary for efficient functioning in a broad assortment of cognitive tasks" (Salthouse, Kausler, & Sauls, 1988, p. 158). Salthouse (1985, 1988a, 1988b, 1991) proposed three broad classifications with which processing resources could be most easily conceptualized: (a) time, as represented by rate of processing; (b) space, as represented by working memory capacity; and (c) energy, as represented by attentional capacity.

To date, the majority of related research has investigated limitations in time, as indexed by reduced rates of processing speed, most likely because a general slowing of behavior with increased age is one of the most reliable observations in both everyday behavior and laboratory tasks (Bayles, Kaszniak, & Tomoeda, 1987; Mazaux et al., 1995; Myerson, Hale, Wagstaff, Poon, & Smith, 1990). Resource theory, however, asserts that speed is a fundamental property of an individual's information processing system, representing the maximum rate at which one is capable of performing, given central, cognitive-computational parameters, rather than reflecting the tempo at which one typically works (Salthouse, 1985), or the time taken by peripheral sensorimotor processes (Cerella, 1985). Cross-sectional studies have demonstrated that reduced rates

of information processing have been associated with performance decrements in older, as compared to younger adults, on tasks assessing object naming latency (Thomas, Fozard, & Waugh, 1977); retrieval of semantic information from long-term memory (Madden, 1985); signal detection, visual discrimination, and temporal-anticipation (Salthouse & Somberg, 1982); perceptual closure (Salthouse & Prill, 1988); spatial abilities and reasoning (Hertzog, 1989; Schaie, 1989; Salthouse, 1987, 1993); working memory (Salthouse & Babcock, 1991; Salthouse, 1992a); symbolic arithmetic (Salthouse & Kersten, 1993); serial and paired associate memory (Salthouse, 1993; Salthouse & Coon, 1993); and study time, decision time, and decision accuracy (Salthouse, 1994). The age-related declines in digit symbol performance have been found to be largely independent of both years of education and self-reported health status and persist despite the use of similar strategies between younger and older adults in task performance (Salthouse, 1992b). Furthermore, neither practice (Salthouse & Somberg, 1982), nor unlimited time to perform (Salthouse, 1994), entirely abolish age differences.

Influence on the Rorschach

Upon initial appraisal, one might wonder how a theory of cognitive aging could contribute to knowledge of the Rorschach response process in older adults, especially given the traditional tendency to view Rorschach profiles as projections of personality (Peterson & Schilling, 1983). Rorschach response formation, however, demands a "...coordinated series of cognitive activities in a

total process of forming, testing, critically evaluating, and communicating perceptual hypotheses" (Korchin & Larson, 1977, p. 159). Thus, Rorschach response formation may be considered dependent on fluid intellectual ability, since the transformation of information is demanded, and it is fluid, rather than crystallized abilities, that show the greatest decrements in performance with age (Salthouse, 1985). As a function of the three perceptual elements of sensation, memory, and association (Rorschach, 1942), there is no reason to suspect that the Rorschach response process would be any more immune to changes with age than any other fluid intellectual ability.

Responding to an inkblot bears little resemblance to the types of tasks (for example, forced choice reaction-time, semantic priming, or memory search tasks) which have been hypothesized to be compromised in the elderly due to reductions in processing speed. Other than an increase in response time, it seems difficult to ascertain where reduced processing rates may manifest on a Rorschach record. Because of the interdependencies of the human information processing system, however, a change in speed with age would likely result in age differences in many other complex, cognitive areas, thus accounting for qualitative, and not just quantitative differences in performance (Salthouse, 1994). For instance, controlling for perceptual speed has attenuated the age differences in inductive reasoning tasks (Salthouse & Mitchell, 1990), and in measures of reasoning and spatial ability (Salthouse, 1993). Bromley (1967) argued that decreases in processing speed would decrease the number of

conceptual transformations that can be achieved, thereby also decreasing the likelihood of unique or high quality transformations. If this is the case, qualitative changes in the Rorschach with advancing age could be expected.

Given both the theoretical foci of the present investigation and the literature examining the Rorschach with advancing age, changes would be expected in those determinants and scores considered indices of information processing effort, efficiency, and cognitive mediation (Exner, 1986). These include total response number (*R*), the frequency of Popular responses (*P*), the frequency of human movement responses (*M*), and Whole responses (*W*). Additional Rorschach cognitive processing information is provided by (a) *Zf*, an index of the complexity of response mediation, or the effort expended to organize the stimulus field; (b) *F+*%, which represents those percepts that demonstrate a “superior-overelaborated” use of the contours, resulting in responses that the majority of individuals would have no difficulty seeing; and (c) *X+*% and *X-*%, which represent two components of the Extended Form Quality distribution (the third being *Xu*%); *X+*% represents perceptual accuracy or conventionality, percepts that do not violate the form demands of the blot, while *X-*% reflects a distorted or statistically rare use of form.

Trait Theory and the Rorschach

Personality Findings

In addition to perception, formation of Rorschach responses is also dependent on representation; while representation itself is based on perception,

it goes beyond the latter process (Blatt, 1990). In creating a problem solving, decision making situation, the Rorschach method provides an opportunity for persons to respond as they usually do to the problem solving and decision making arenas of their lives, potentially revealing much about their personality style, needs, attitudes, and concerns - hence responses are determined by the meaning or representation assigned to the apprehended percept (Weiner, 1994). Research examining personality factors and the Rorschach has tended to compare constructs defined by the clinical and validity scales of the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1940) with those purported to assess the same dimensions on the Rorschach. Archer and Krishnamurthy (1993), in their review of the 37 studies published between 1943 and 1992 which examined such interrelationships in adult samples, concluded that, "...despite their common functions of assessing personality and psychopathology" (p. 285), only limited or minimal relationships between the two measures were indicated, a result echoed by others (Acklin, 1993). When significant relationships were found, they tended to be observed in studies that were theory driven or had explicit research hypotheses (Exner, Armbruster, & Mittman, 1978). Cross-validated findings have appeared to be the exception, however. Research in which the external construct validity of Rorschach personality variables was examined with other well validated measures of the same factors found that, with few exceptions, the Rorschach variables thought to represent ego strength, self-esteem, social desirability, and locus of control failed

to correlate significantly with self-report measures of those same constructs (Greenwald, 1990). It has been suggested that the lack of relationship is to be expected, since responding to the Rorschach depends on processes not tapped by self-report measures (Acklin, 1993; Weiner, 1993). Meyer (1993), however, found that Rorschach indices of depression (DEPI), hypervigilant scanning (HVI), and obsessive cognitive processing style (OBS), and MMPI-2 (Hathaway & McKinley, 1989) measures of the same respective processes (i.e., scores on Scales 2, 6, and 7), correlated significantly when Rorschach response frequency (R) was high ($R > 29$); no correlations were found between the MMPI-2 and Rorschach variables for the general sample when response frequency was collapsed. Thus, Meyer (1993) suggested that, at least in his sample of 90 adult patients with a mean age of 33.5 years, R functioned as a dimension of openness or ability to acknowledge dysfunction and reveal symptomatology, especially since, in low R records, the MMPI-2 scales tended to contradict the Rorschach constellations.

The MMPI in all its versions tends to provide a report of an individual's current affective and psychological status, rather than an index of underlying, stable, personality traits. Indeed, from a clinical perspective, the test appears to be most informative when persons are experiencing state-related needs and presses. While psychological turmoil and distress obviously influence Rorschach responses, Greenwald's (1993) study appears to be the only one that has assessed how normal variations in personality manifest on the Rorschach.

Arguably, the clinical utility of the Rorschach with older adults will only be realized when it is determined what can be expected in a population of healthy elderly, and this necessarily includes an investigation of how variations in normal, non-pathological, personality variables influence Rorschach responses.

A Trait Theory Perspective

Trait theory (Costa & McCrae, 1980), a comprehensive and widely researched theory of personality, seems to be a logical point from which to consider the issue of normal personality variation and the Rorschach for several reasons: (a) Cross-validation studies examining the Rorschach method have led to the suggestion that research which is theory or hypothesis driven is more informative (Archer & Krishnamurthy, 1993), and (b) trait theory has proven to be remarkably robust. Years of personality research has suggested that five global domains are "both necessary and reasonably sufficient" (McCrae & Costa, 1986, p. 1001) for describing the major features of personality (Digman, 1990; Norman, 1963). Costa and McCrae (1985, 1992) labelled these five factors Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. Each domain can be further subdivided into more specific facets, but generally, Neuroticism refers to emotional stability, Extraversion to sociability and assertiveness, Openness to intellectual curiosity and independence of judgment, Agreeableness to the interpersonal tendency to be altruistic and empathic, and Conscientiousness to the tendency to be obsessive (Costa & McCrae, 1992).

Longitudinal studies have demonstrated that these five general domains or traits remain relatively stable across the life-span, although specific facets do show situational variation (Costa & McCrae, 1980; Costa et al., 1986). Thus, Rorschach age changes as a result of alterations in personality functioning would not be expected. Of interest, however, is the manner in which these five traits influence the Rorschach response process. Costa and McCrae (1986) did investigate longitudinal age changes in the Holtzman Inkblot Technique (HIT; Holtzman, 1961), a projective test in which response number is a constant, rather than a variable, since only one response per card is permitted. In this cross-sectional study of persons aged 25 to 90, little evidence of "maturational" change in the HIT variables was discovered, nor was there any relationship between specific HIT variables and Neuroticism, Extraversion, and Openness as assessed on the NEO Inventory (Costa & McCrae, 1986).

Myers' (1993) data on the MMPI-2 and the Rorschach suggests that individuals high in Openness and low on Neuroticism would provide, at the very least, a greater number of responses than individuals low on Openness and high on Neuroticism. Given that Extraversion is thought to represent an individual's temperamental level of energy and enthusiasm, and that Agreeableness is a dimension that contrasts trust and cooperation with cynicism and antagonism (McCrae, 1991; McCrae & John, 1991), it would seem that persons high in both factors would demonstrate more eagerness and less apprehension when

approaching the task of the Rorschach, yielding more productive protocols both qualitatively and quantitatively.

Indirect evidence for the latter assumption can be found in the study by Dollinger and Leong (1993), which found that people high in Agreeableness, Openness and Extraversion were more likely to volunteer personal information, as well as consent to be followed longitudinally in a hypothetical psychological experiment. Other research has demonstrated openness to experience to be highly negatively correlated with political conservatism (Riemann, Grubich, Hempel, Mergl, & Richter, 1993); since the features of conservatism include a lack tolerance for the unfamiliar and a dislike of uncertainty, persons low in Openness (and therefore high in conservatism) could be expected to produce less informative and/or productive Rorschach protocols as a result of the inherent ambiguity of the task. Individuals high in Openness have also been observed to perform better on tasks assessing divergent thinking skills, tasks which demand unusual or original responses and/or as many responses as can be generated (i.e., productivity; McCrae, 1987), arguably all abilities necessary to Rorschach response formation. Lastly, persons scoring higher on Openness were found to create personal photo essays (a type of projective task) that were more self-reflective, creative, and interesting than those produced by persons low in Openness (Dollinger & Clancy, 1993). The paucity of direct data, however, as well as the lack of any examination of the five factor model with the Rorschach, suggests that further research is necessary.

Residential Status and Older Adults

The Residential Care Population: General Characteristics

Since the early 1970's, the proportion of the population aged 65 years and over who live in residential care facilities, at any one moment in time, has remained at about 5% (Brody, 1993a; Butler, Lewis, & Sunderland, 1991). As already noted, however, this point prevalence estimate of residency is a grave underestimate of the 25% to 50% of elderly who will eventually experience at least one episode of institutional long term care (McConnel, 1984). Moreover, since the risk of institutionalization rises with advancing age (Butler et al., 1991), increases in life expectancy (Manton & Stallard, 1991), as well as in the cohort of the "old-old" (i.e., persons age 75 and older) (Brody, 1993b), have contributed to a residential care facility population that is rapidly growing: Numbering 1.6 million in 1989, the nursing home population is expected to reach 2 million by the year 2000 and more than double to 4.6 million by the year 2040 (Butler et al., 1991). Thus, institutionalization is fast becoming one of the commonplace challenges facing people as they age.

According to the 1996 U.S. Senate Special Committee on Aging report, residents of care facilities tend to be predominantly Caucasian (93%), women (approximately 80%), and very old (45% are 85 years and older), with an average age of 79 years. Residential facilities provide long-term care for older adults with chronic illness and/or disability (average length of stay of 2.5 years), as well as short-term rehabilitative and convalescent services to those elderly

recovering from acute injury or sickness (Streim & Katz, 1996; Streim et al., 1996). Placement can also result, however, as a result of non-medical reasons, such as social isolation, economic considerations, and general apprehension about the ability to adequately care for oneself (Osterweil, Mulford, Syndulko, & Martin, 1994; Winocur & Moscovitch, 1990). Cognitive impairment may, or may not, be a contributing factor to placement (Holland & Rabbitt, 1991; Osterweil et al., 1994). Thus, just like their community dwelling counterparts, the elderly residing in care facilities are quite heterogeneous in terms of both their individual characteristics and their service needs (Feifel & Strack, 1987; Manton, Liu, & Cornelius, 1985; Tobin, 1988).

Mental Health Issues

As a group, older adults admitted to residential care facilities since 1989 have been more ill than in the past, with multiple, chronic medical comorbidities and disabilities the norm (Butler et al., 1991; Manton, Cornelius, & Woodbury, 1995). Not surprisingly, then, such facilities have become a major locus of geriatric health care in the United States (Liptzin, 1992). In no other branch of medicine has that focus been more welcome than in the area of mental health. Estimates of diagnosable psychiatric disorders and their attendant behavioral disturbances (e.g., confusion, withdrawal, agitation) in the residential care population run from 80% to 90%; the majority (from 50% to 75%) represent dementing illnesses, primarily Alzheimer's disease, followed by depressive disorders (Liptzin, 1992; Streim & Katz, 1996; Streim et al., 1996; Tariot et al.,

1993). Despite the need, however, psychiatric services are often inadequate and in the past, frequently led not only to misdiagnosis and neglect, but to the misuse of psychotropic medications and/or physical restraints as behavioral management tools (Streim & Katz, 1996; Tourigny-Rivard & Drury, 1987).

In 1987, Congress addressed the issue by enacting the Nursing Home Reform Amendments as part of the Omnibus Budget Reconciliation Act, Public Law 100-203, a public policy initiative designed to "...improve the lives of nursing home patients by explicitly recognizing the importance of psychological and social domains of their lives, restricting the use of psychotropic medications and physical restraints, and advocating for specialized rehabilitative services to attain or maintain patients' highest practicable physical, mental, and psychosocial well-being" (Streim et al, 1996, p. 921). Accordingly, "the facility must ensure that a resident who displays mental or psychosocial adjustment difficulties receives appropriate services to correct the assessed problem" (Health Care Financing Administration, 1991, p. 48,896 as cited by Streim & Katz, 1996).

Psychological disturbances in residents of care facilities often have complicated presentations, given the potential mixture of cognitive impairment, multiple medical diagnoses (and hence medications) and behavioral symptoms that can arise (Liptzin, 1992). Short-stay residents, who are generally younger and more likely to have been admitted from an acute care hospital with a primary diagnosis of hip fracture, stroke or cancer, are less likely to suffer from

irreversible cognitive impairment or incontinence (Engle & Graney, 1993; Streim & Katz, 1996). The mental health care needs of the latter population, who are discharged home or die after relatively brief nursing home residencies, often differ from those of the longer-term inhabitants, in whom managing behavioral disturbances are of greatest import. In short-stay residents, screening of potential cognitive impairments, treatment of depression and/or anxiety, and helping residents adjust to the sequelae of a new illness or disability, are more likely to be the foci of mental health services (Streim & Katz, 1996).

Obviously, whatever the particular need, intervention planning for the management of nursing home residents with psychiatric or behavioral problems demands a comprehensive assessment integrating information regarding all aspects of an individual (Liptzin, 1992). Given their training in, and appreciation of, the biopsychosocial determinants of behavior, clinical psychologists would seem poised to make unique contributions as mental health providers in residential care settings. Yet, a search of the *Psychinfo* database from the 1970's to the present revealed that, to date, issues in this population have largely been addressed by social work, nursing, and psychiatry (see for example Brody & Semel, 1993; Ingersoll-Dayton, 1993; Streim et al., 1996). A psychological perspective is thus sorely needed.

Lezak (1995, p. 8) has stated that psychological assessment provides the useful functions of diagnosis, patient care (including considerations about management and planning), treatment (for developing programs and for

evaluating their efficacy), and research. It has been asserted that the information the Rorschach delivers regarding "...an individual's perceptual, cognitive, emotional, and social processes is neither matched nor approximated by any other psychological technique" (Howes, 1981, p.348), making it a useful adjunct to any psychological assessment. It is an especially attractive tool in geriatric assessment, both because of its ease of administration, and because it does not penalize an individual for a lack of testwise skills, or for decrements in coordination or speed of response (Hayslip & Loman, 1986; Kahana, 1978). The aforementioned characteristics may also make the Rorschach a useful measure, either as predictor or criterion, in treatment studies, given the long overdue interest in evaluating everything from psychotherapy (Salamon, 1986) to empowerment (Oluwafemi Agbayewa, Ong, & Wilden, 1990), to behavioral skills training (Hoyer, Lopez, & Goldstein, 1982; Vaccaro, 1990) in the older residential care facility population. But, before it can be used with any confidence, either clinically or empirically, information regarding if, and how, the Rorschach response process may change as a result of age and/or residential status is desirable.

Psychological Effects of Residential Status

Entering a residential care facility is likely one of life's least pleasant experiences. Intuitively, leaving one's home, belongings, and community to move in with strangers, many of whom one will be dependent upon, must be an intimidating and often frightening experience. Upon admission, older adults must

cope with the cause(s) of their placement (for example, deterioration in health, new disability), alterations in lifestyle, psychological separation (Dye, 1982), a social organization with new and distinctive social processes (Moos & Lemke, 1985), and changes in one's conceptions of self, body, and biographic time (Golander, 1995). As Dye (1982) stated, "It is an experience prodromal of death and yet without the finality or the consciousness of death" (p. 533). Given the stresses of an often sudden change in residence on an already vulnerable individual, it is not surprising that placement in care facilities is frequently associated with increased morbidity, disorientation, and mortality (Butler et al., 1991).

The question remains, however: Does institutionalization exert unique effects on those older adults that have successfully adapted to (or at least accepted) their new environments, once thus settled? In terms of the Rorschach response process, the answer would seem to be yes. As previously noted, the early studies investigating test performance, which relied heavily on older adults residing in care facilities, generally found diminished levels of emotional responsivity, poorer integrative abilities, lower perceptual accuracy, and decreased intellectual efficiency and productivity with advancing age (Ames, 1960, 1966; Ames et al., 1974; Caldwell, 1954; Davidson & Kruglov, 1952; Klopfer, 1946). Of course, as also already noted, these pre-Exner system studies were fraught with methodological difficulties, not the least of which was lack of control for cognitive status. Ames' (1973) better designed study found

that institutionalization was related to poorer quality Rorschach protocols, even when age, sex, and socioeconomic status were controlled. Unfortunately, while Ames did divide the study participants into presenile and senile groups, she did so on the basis of their Rorschach protocols, a rather circular method; furthermore, the relationship between residency and cognitive status was not reported. It is thus possible that cognitive impairment, rather than place of residence per se, contributed to her findings.

Residential status has been found to be an important variable in more contemporary studies researching neuropsychological functioning in older adults. In a series of investigations, older adults living in residential care facilities have performed significantly more poorly than their community dwelling counterparts on tasks of paired associate learning, verbal and design fluency, verbal and visual memory, and set formation and attentional shift, even when level of general intellect was controlled (Winocur & Moscovitch, 1983; Winocur & Moscovitch, 1990; Winocur, Moscovitch, & Stuss, 1996). In all of the investigations, participants from residential facilities were chosen for inclusion only if they were free of clinically diagnosed cognitive or psychiatric problems, and judged to be functioning normally by nursing staff. Furthermore, all participants were equivalent in terms of health, age, education, and socioeconomic status. Nevertheless, since a proportion of the institutionalized group performed at a level indistinguishable from the community group, the authors concluded that it was not likely that institutionalization invariably leads to

cognitive impairment (Winocur & Moscovitch, 1990). Indeed, in a separate investigation, they demonstrated that cognitive function could vary longitudinally as a result of adjustment to living in a residential care facility, such that cognitive performance improved with increases in perceived environmental control and social activity level (Winocur, Moscovitch, & Freedman, 1987).

Another group of investigators also found that an elderly residential care facility population performed more poorly, as compared to older adults living independently, on neuropsychological tasks assessing visual and verbal learning and memory, verbal fluency, visuoconstruction, and information processing rate (as assessed by digit symbol substitution), regardless of cognitive status (Steenhuis & Østbye, 1995). Level of education and age were equivalent between the two groups. In other work, statistically significant differences on task of confrontational naming between community dwelling older adults and those residing in care facilities were not found for participants with more than 13 years of education; institutionalized subjects with six to nine years of education, however, did perform more poorly, regardless of age (Neils et al., 1995).

Given that the present study investigated the Rorschach response process in light of resource theory, the neuropsychological studies are of particular interest. The findings suggested that, as a group, persons residing in care facilities would likely evidence slower rates of information processing. In terms of the trait theory aspect of the study, however, no difference in personality functioning was expected between residential groups. Longitudinal studies have

demonstrated that, in general, individuals tend to maintain the same rank on a variety of social and psychological indicators throughout the later years of life (Maddox & Douglass, 1974). Although some studies have demonstrated group differences in personality between “young-old” and “old-old” cohorts (Martin et al., 1992); they have not been in the majority (Costa et al., 1986; Feifel & Strack, 1987). Furthermore, in a review of the literature, Tobin (1988) found that self-concept was remarkably stable in older adults followed through their transition from community dwellers to placement in residential care facilities.

Further Considerations

Epidemiological data indicate that, while only about 2% of community dwelling adults over the age of 65 suffer from major depression, there are substantial numbers of older people (around 20%) who experience clinically significant depressive symptoms (Scogin, 1994). These rates are much higher, of course, in the elderly residential care population, where depressive disorders are the second most common psychiatric disturbance (Streim et al., 1996). The Rorschach records of depressed persons, as compared to non-depressed persons, have been found to differ with respect to several determinants (e.g., Vista responses (V), color-shading blends (C.Sh)) (Exner, 1986). Additionally, depressed older adults frequently demonstrate reduced rates of information processing (Kaszniak & Ditraglia Christenson, 1994). As a result, consideration of affective status is of import if changes in Rorschach responses with advancing age are to be understood within a framework of a cognitive theory of aging.

METHODS

Participants

Forty community-dwelling volunteers, 65 years and older, were recruited from local churches, community groups, or by word-of-mouth in a moderately sized mid-Western city. Forty long-term care facility participants were selected from a Home for Veterans and two privately owned nursing homes. Specifically, social workers were asked to refer those residents 65 years and older who appeared functionally intact, and who possessed adequate verbal skills and motor functions. All subjects had to possess sufficient hearing, vision, and motor skills to physically perform the Wechsler Adult Intelligence Scale - Revised (WAIS-R) Digit Symbol Substitution subtest (Wechsler, 1981), and earn a score of 23 or more out of 30 on the Mini Mental Status Exam (MMSE; Folstein, Folstein, & McHugh, 1975) to be included in the study. While a score below 24 is generally thought to represent the presence of cognitive impairment on the MMSE (Folstein, Anthony, Parhad, Duffy, & Gruenberg, 1985), a slightly more liberal criterion was adopted here, based on research demonstrating that elderly non-demented institutionalized adults tend to perform at levels considered impaired by general standards of practice (Osterweil et al., 1994). Non-depressed participants were preferred in both groups, but subjects who endorsed active depressive symptoms (i.e., scored greater than 10 out of 30 on the Geriatric Depression Scale) (GDS; Yesavage et al., 1983), were not excluded. Additionally, no attempt was made to exclude subjects with a history

of neurologic or active psychiatric disorders , degenerative motor disorders (e.g. Parkinson's Disease), or advanced systemic diseases (e.g. severe heart disease). While it was appreciated that health status could serve to confound the results, 4 out of every 5 persons over 65 years of age have at least one chronic medical condition (La Rue & Markee, 1995) and the institutionalized population tend to suffer multiple morbidities (Manton et al., 1985).

Procedure

Upon initial contact with all potential participants, informed consent for testing was obtained during an interview (a copy of the consent form can be found in Appendix A); subjects were told that their participation was voluntary and part of a university research project on aging. Consenting subjects were then screened with the MMSE and Digit Symbol subtests. Subjects meeting inclusion criteria were subsequently administered the Wide Range Achievement Test 3 (WRAT 3) reading subtest (Wilkinson, 1993), the GDS, the NEO-FFI (Costa & McCrae, 1992), and the Rorschach (Rorschach, 1942). Demographic information, including age, education, medical and psychiatric history, and current medications were also collected from each subject or from their medical chart (in the case of subjects residing in care facilities). All assessments were administered by the investigator.

Tests and Measures

Digit-Symbol Substitution Subtest, WAIS-R

The Digit-Symbol Substitution Subtest of the WAIS-R (Wechsler, 1981) is a reliable test (test-retest reliability = .82) believed to be a measure of clerical speed and accuracy, psychomotor speed, visual short-term memory, and the ability to follow directions (Kaufman, 1990, p. 411). Of all the WAIS-R subtests, it shows the greatest difference between old and young adults (Botwinick, 1978 as cited by Gilmore, Royer, & Gruhn, 1983). Evidence suggests, however, that "...although the digit symbol substitution test clearly involves motor and memory components, these factors are probably not major contributors to the age differences in digit symbol score" (Salthouse, 1985, p.310).

With respect to the contribution of memory to digit symbol task performance, two studies which reduced memory involvement, either by pretraining younger and older adults to the same accuracy criterion of associating digit symbol pairs (Erber, Botwinick, & Storandt, 1981), or by reducing the number of digit symbol pairs (Salthouse, 1978), still resulted in the age trends normally observed on this task. Studies in which the motor components of the task were minimized, either by altering the task to require the crossing out, rather than the writing out of symbols (Salthouse, 1978), or by determining coding speed (i.e. handwriting speed) and then subtracting this from digit symbol performance (Erber et al., 1981), also resulted in the expected age trends in which healthy younger adults performed better than healthy older

adults. Indeed, studies in which the difficulty of the standard Digit Symbol Substitution stimulus has been varied have concluded that the performance decline associated with age was a result of the information-processing operations of symbol encoding and visual search (Gilmore, Royer, & Gruhn, 1983; Royer, Gilmore, & Gruhn, 1981). Furthermore, Salthouse (1992b) has recently demonstrated that a composite measure of perceptual processing speed accounted for the majority of variance observed in Digit Symbol scores; in contrast, a composite measure of motor speed demonstrated no such association. In another investigation, Salthouse and his colleagues found that memory, sustained attention, and manual coordination had little influence on the relations between age and speeded substitution performance (Salthouse, Letz, & Hooisma, 1994). Thus, the available evidence suggests that this subtest is currently the best measure of information processing speed available (Salthouse, 1985).

Exner Comprehensive System for the Rorschach

The Exner method (Exner, 1986) is currently the most commonly used system of scoring and interpreting the Rorschach (Piotrowski, Sherry, & Keller, 1985). Although varying widely, a detailed account of validity measures are reported by Exner (1986); interrater reliability for scoring is usually reported at or about .85 (Gross, Newton, & Brooks, 1990). Meta-analytic reviews have concluded that the reliability and validity of the Rorschach is comparable to that of the MMPI and WAIS (Atkinson, 1986; Parker, Hanson, & Hunsley, 1988). To

date, norms for persons over the age of 60 have not been published; results from previous studies, however, suggests that differences in Rorschach indices between the elderly and younger adults are to be expected.

Geriatric Depression Scale (GDS)

The GDS (Yesavage et al., 1983) is a reliable and valid self-rating depression screening scale for elderly populations both in the community (Yesavage et al., 1983; Zgourides, Spofford, & Doppelt, 1989) and in institutions (Koenig, Meador, Cohen, & Blazer, 1988; Parmelee, Lawton, & Katz, 1989). Furthermore, the scale has been found to be a valid indicator of depression in patients with mild to moderate dementia (O'Riordan, Hayes, O'Neill, Shelley, Walsh, & Coakley, 1990). The GDS consists of 30 items with binary response categories and takes about five minutes to complete. A cut-off of 14/30 or greater is representative of clinically significant depressive symptomatology.

Mini Mental Status Exam (MMSE)

The 30 questions of the MMSE (Folstein, Folstein, & McHugh, 1975) test the following five areas of mental status in a quick and standardized format: orientation, registration, attention/calculation, recall, and language. Original standardization revealed no overlap between the scores of senile patients and aged control subjects and the scale has proven to be a good screening test for dementia in the institutionalized elderly (Kafonek, Ettinger, Roca, Kittner, Taylor, & German, 1989). Test-retest reliability (over 24 hours) has been reported to range between .82 and .98; additionally, MMSE scores have proven

valid measures of cognitive impairments correlating with CAT-scans, neurological examinations, and the WAIS-R (Holzer, Tischler, Leaf, & Myers, 1984).

NEO Five-Factor Inventory (NEO-FFI)

The NEO-FFI (Costa & McCrae, 1992) is a 60 item self-report personality measure yielding scores for the five domains of Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A), and Conscientiousness (C). Internal reliability is adequate, as represented by coefficient alpha values of .86, .77, .73, .68., and .90 for N, E, O, A, and C respectively (Costa & McCrae, 1992). Convergent validity of the respective scales with adjective factors assessing the same constructs ranged from .56 to .62, with none of the divergent correlations exceeding .20 (Costa & McCrae, 1992).

Reading Subtest, WRAT 3

The reading subtest of the WRAT 3 (Wilkinson, 1993) consists of a list of 42 words that an examinee reads aloud. There is a time limit of 10 seconds per word, and the test is discontinued following 10 consecutive failures. This subtest is based on the assumption that familiar words will be pronounced correctly, thus reflecting vocabulary level. Because vocabulary, in turn, tends to remain stable with advancing age, it is often used as an index of premorbid functioning (Albert, Duffy, & Naeser, 1987). Raw scores from the test can be converted into standard score with a mean of 100 and a standard deviation of 15.

Scoring

Protocols were scored by the examiner according to the conventional directions accompanying each respective test. Exner's Comprehensive System (1986) was used to score the Rorschach protocols. Additionally, a M.A. level psychologist experienced in the administration and scoring of the Rorschach according to Exner's method acted as a separate judge, re-scoring 50% of the protocols; in usual practice, re-scoring 25% to 35% of the total protocols is considered sufficient to determine reliability (Exner, Kinder, & Curtiss, 1995). Interscorer agreement, ascertained by calculating the percentage concurrence between the following eight segments, as suggested by Exner et al. (1996), was as follows: (1) Location/Developmental quality - 95%, (2) Determinants - 89%, (3) Form quality - 82%, (4) Pairs - 98%, (5) Primary content - 91%, (6) Populars - 94%, (7) Z scores - 90%, and (8) Special scores - 86%. Thus, interscorer agreement exceeded the recommended 80% (Exner et al., 1995) in all cases.

HYPOTHESES AND DATA ANALYSIS

The purpose of this study was to examine how reduced rates of information processing and variation in normal personality factors manifest in the Rorschach response process of older adults residing both in the community and in care facilities. Because of numerous significance tests performed on this data set, precautions were taken to control for alpha inflation. Thus, for all analyses, an alpha level of .01 was adopted; $p \leq .05$ were regarded as trends.

Demographic data were examined by descriptive statistics, as were the variables under investigation. Relationships among the study variables were also examined by Pearson product-moment correlations. Additionally, in light of the literature reviewed above, the following hypothesis were tested:

1. It was hypothesized that reduced rates of processing information, as measured by the WAIS-R Digit Symbol Substitution Subtest, would be associated with increasing age, increased levels of depressive symptomatology, and residence in a care facility.

Data Analysis: To test this hypothesis, information processing scores were collapsed across groups and correlated with age and level of depression; a correlational analysis was also used to examine the relationship between residential status and information processing.

2. It was hypothesized that reduced rates of information processing would affect the productivity and quality of Rorschach responses. Total response number (R), the frequency of Popular (P) responses, the frequency of human

movement responses (*M*), and the value of *F*+%, all shown to decline with age in the literature, were expected to be associated with lower Digit Symbol scores, as were Whole responses (*W*), which have been shown to increase with advancing age. The other determinants of interest, considered to represent information processing effort, efficiency, and cognitive mediation, were *Zf*, *X*+% and *X*-%. The choice of all these determinants also took into consideration those Rorschach variables suggested to be most appropriate for analysis with parametric statistics, based on the skew, kurtosis, number of available values, and the percentage of real zero values of these variables, as reported in Exner's (1990) normative and patient data (Viglione, 1995).

Data Analysis: To test the hypothesis that reduced rates of information processing are associated with lower quality and less efficiently processed percepts, Rorschach performance was regressed on Digit Symbol scores. Given the meaning assigned to the various constructs by Exner (1986), higher rates of information processing were expected to be associated with better quality protocols as represented by lower *X*-%, and higher *R*, *P*, *M*, *W*, *Zf*, *F*+% and *X*+%. In the interest of minimizing the Type I errors inherent with multiple statistical tests, however, the eight Rorschach determinants were submitted to a Principal Components Analysis in order to reduce the number of dependent variables.

3. It was hypothesized that higher quality Rorschach records as defined above would be associated with persons who are high in Openness (*O*),

Agreeableness (A), and Extraversion (E) and low in Neuroticism (N). No relationship was expected with Conscientiousness (C).

Data Analysis: This hypothesis was tested by linear regression analyses in which Rorschach performance was regressed on each of the personality constructs in turn.

4. Rorschach response formation involves perceptual and cognitive processes influenced by the underlying personality dynamics of the individual, or both perception and representation (Blatt, 1990). Combining the results of the separate literatures investigating information processing rate, five-factor personality theory, and the Rorschach, the aforementioned response process was conceptualized as:

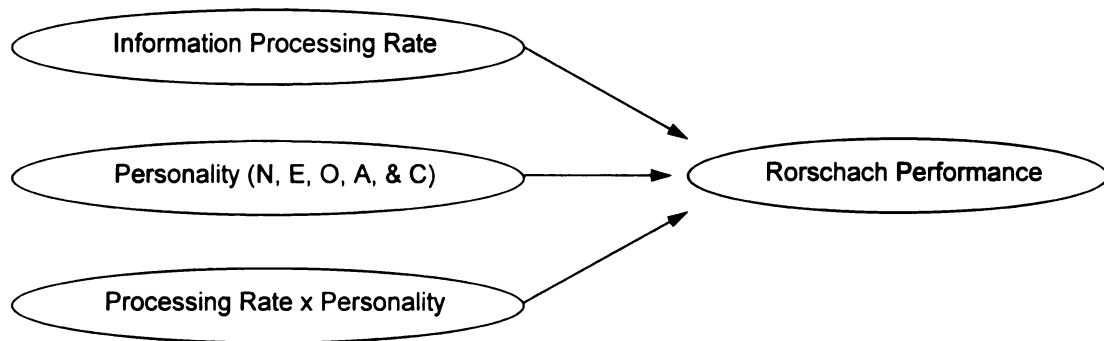


Figure1. Proposed Model of Variable Interaction

It was expected that processing speed and personality, both together and individually, would make statistically significant contributions to the variance observed in Rorschach performance when both were included as predictors in

the regression equation. In addition, the interaction of the main effects (DSym by Personality) were considered.

Data Analysis: To test this model, hierarchical multiple regression analyses were run in which the Rorschach factors were each regressed on information processing rate, a given personality construct (N, E, O, A, or C), and the interaction term formed by DSym and said personality variable. Processing speed and a given personality construct were always added as a set of main effects, in order to ascertain which predictor accounted for more of the variance in Rorschach performance; the interaction term was then subsequently added.

RESULTS

Sample Selection and Response Rate

A total of 97 community-dwelling adults (70 women and 27 men) aged 65 years and older were contacted for inclusion in the study. Fifty-five people refused to participate, three because of visual difficulties, seven due to illness, and the remainder for reasons ranging from being too busy to a lack of interest. Overall, 42 people gave consent to participate, but two subjects were excluded, one because of a failure to comprehend the requirements of the digit symbol substitution task and a MMSE score below 23, the other because of poor vision. Forty participants (27 women and 13 men) completed all testing; the resultant ratio of women to men corresponds to the 1.5:1.0 gender ratio observed in the general population of adults 65 years and older, according to 1990 Census data. Participants required, on average, approximately two-and-a-half hours to finish the assessment. All community dwelling subjects were tested in one sitting.

Permission to collect data at the Home for Veterans was originally sought through the Director of Social Services, who subsequently garnered the approval of the head of each of four governing bodies within that facility, with final approval contingent upon the commandant's decision. Permission to collect data from the two privately owned and operated nursing homes was obtained by contacting the chief social workers in each case, who subsequently obtained permission from their respective managing directors. All of the care facilities were operating at or near 100% occupancy. Social workers served as study

liaisons at each facility. In addition to being familiar with the residents' personalities, attitudes, and overall health status, all social workers regularly administered mental status exams, similar to the MMSE, to their respective patients. They were asked to refer residents they believed to be physically and cognitively capable of completing all assessment measures.

The Home for Veterans provides three levels of care (independent, semi-skilled, and skilled) to military veterans or their spouses. During the time that data were collected, the Home had a population of 647 residents, 34 (5%) of whom were women. Social workers nominated 20 women as being suitable for the study. Of those, 12 completed the entire assessment battery, while five refused, two failed the inclusion criteria, and one was too visually impaired to complete test items. Of the 24 men who were nominated, eight refused and two failed inclusion criteria; another protocol was discarded because the participant refused to take the Rorschach after completing the remainder of the battery.

The other participating facilities, both of which provide basic or skilled care to their residents, had a census of 113 (86% women) and 133 (87% women), respectively. Of the 20 women nominated between the two homes, two refused, one was legally blind, and two failed the MMSE and Digit Symbol inclusion criteria. Only one of the latter facilities referred men, and both of them refused participation. As with the community-dwellers, 27 women and 13 men residing in care facilities completed the testing battery, again approximating the ratio of women to men over 65 in the general population. The majority required

approximately two to three hours and one sitting to finish the assessment, though four of the women asked to be tested in shorter spans over two days.

Descriptive Statistics

Demographic Data

Overall, 80 people (54 women and 26 men) completed all measures (40 community-dwellers and 40 residents of care facilities). The total sample ranged in age from 66 to 95, with a mean age of 80 years ($SD = 7.49$). Age was normally distributed across the sample (Kolmogorov-Smirnov statistic = .08, $df = 80$, $p > .20$). With the exception of two African American women, the remainder of the sample was Caucasian. The majority of participants (47.5%) were widowed; 13.8% of the sample had never married, 27.5% were still married, and 11.3% had been divorced or separated. Fourteen of the sample reported multiple marriages (six women and eight men). Number of children ranged from none to 8 with a mean number of 2 births per family.

As a whole, the sample was well-educated: Mean number of years of schooling was 12.54 ($SD = 3.04$) and ranged from 6 to 18 years. Approximately 48% of participants reported continuing their education following high school and almost 28% earned Bachelor's degrees or higher. Table 1 presents the results of independent group t -tests evaluating residential status and gender differences. Residents of care facilities were significantly older than community-dwellers; both groups were comparable in education, however. Women did not differ from men in either age or level of education.

Table 1

Residential and Gender Differences in Age and Education

	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Age					
Community ^a	77.47	6.06	2.91	72.27	<.01
Care Facility ^a	82.13	8.11			
Women ^b	80.54	7.71	1.27	78	ns
Men ^c	78.27	6.90			
Education					
Community ^a	12.98	2.53	1.29	71.36	ns
Care Facility ^a	12.10	3.46			
Women ^b	13.02	2.70	1.90	39.85	ns
Men ^c	11.54	3.50			

Note. ^a*n* = 40. ^b*n* = 54. ^c*n* = 26. *M* = mean; *SD* = standard deviation; *df* = degrees of freedom; ns = non-significant. All *p* values are two-tailed.

Length of residency at the time of assessment for the subjects residing in the long-term care facilities ranged from 1 to 276 months, with a mean of 33.85 months (*SD* = 47.56); the median length of residence was 22 months. Three of the female residents, who were convalescing from surgery and hip fractures, expected to be discharged home in the future; the remainder of the group were long-stay residents. The main reason reported by subjects for admission into a given residential care facility was declining health status demanding assistance with daily living activities (67.5%). Eight subjects reported placing themselves

because they felt that their health might deteriorate and thus wanted to be settled before becoming a burden on family or friends; three were admitted following surgery; and two subjects entered facilities because of a lack of money to live independently. Pearson product-moment correlations (all two-tailed) demonstrated that length of residency was not associated with age ($r = .06, p > .10$), number of medical diagnoses ($r = .02, p > .10$), level of depressive symptomatology ($r = .05, p > .10$), or current mental status ($r = -.20, p > .10$) in this group of participants.

The number of currently diagnosed medical conditions (excluding psychiatric diagnoses) for the entire group of subjects ranged from none to 9, with a mean of 3.46 ($SD = 1.95$). As a group, participants were taking a mean number of 4.40 ($SD = 3.02$) prescribed medications on a daily basis (excluding vitamins or other nutritional supplements, but including psychotropic agents); across the sample, daily medication number ranged from a low of 0 to a high of 13. Not surprisingly, a Pearson product-moment correlation analysis demonstrated that number of medical diagnoses was positively and significantly associated with the number of prescribed medications ($r = .64, p < .01$, two-tailed). Table 2 presents the results of independent group *t*-tests evaluating differences in medical history between residents of the community and residents of care facilities: Both number of diagnoses and number of prescribed medications were significantly greater in the latter group. Women did not differ

from men in either diagnoses ($t(78) = 1.86, p > .05$, two-tailed) or in medication number ($t(78) = .03, p > .10$, two-tailed).

Table 2

Residential Differences in Medical History

	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Medical Diagnoses					
Community	2.42	1.55	-5.58	78	<.01
Care Facility	4.50	1.77			
Prescribed Medications					
Community	3.13	3.04	-4.14	78	<.01
Care Facility	5.68	2.43			

Note. $N = 80$. All p values are two-tailed.

Table 3 presents the percentage of each residential group actively diagnosed with at least one ailment in the most commonly reported medical diagnostic categories. Eighteen of the residents of care facilities had either a history, or current diagnosis, of some type of neurological disorder, as compared to only two of the community-dwellers. Cancer survivors numbered seven amongst the community-dwellers and six amongst the residents of care facilities. Approximately 34% of the entire sample had undergone at least unilateral cataract removal (10 community-dwellers and 17 care facility dwellers). Only

care facility residents reported experiencing fractures of the hip (six women, one man) or ribs (one woman).

Table 3

Frequency of Diagnostic Category

	Percent	
	Community ^a	Care Facility ^b
Arthritis (mild)	57.5	17.5
Cardiac Abnormalities	45	52.5
Cerebrovascular Accident	5	20
Degenerative Joint Disease	5	37.5
Dementia (mild)	2.5	7.5
Diabetes	10	27.5
Gastrointestinal Disorders	5	12.5
Hypertension	22.5	42.5
Osteoporosis	0	7.5
Parkinson's Disease	0	12.5
Renal/Bladder Disorders	7.5	27.5
Respiratory Disorders	12.5	12.5
Thyroid Abnormalities	15	17.5
Visual Abnormalities	12.5	12.5

Note. ^a*n* = 40. ^b*n* = 40.

All but three participants, who needed reading or driving glasses, were outfitted with corrective bifocal lenses; 67.5% of the sample classified their visual acuity when wearing glasses as good or adequate, while 32.5% rated their vision as fair or poor. Hearing aids were used by only 15% of the entire group, the

majority of whom (eight) were men; 95% of the sample rated their hearing as good or adequate; the remaining 5% reported their hearing to be fair or poor. Regardless of their sensory self-perceptions, however, all participants had adequate vision and hearing for testing. Additionally, all subjects had adequate use of their dominant hand. All but three of the community-dwellers were ambulatory, either without assistance or with the use of a walker or cane; in contrast, 12 of the 40 residential facility dwellers were confined to a wheelchair.

In regard to psychiatric history, 12.5% of the community dwelling participants (four women and one man) described a history of treatment for depression, while one male subject had a history of bipolar affective disorder. Twenty percent of community-dwellers (four men and four women) reported attending counseling for grief or adjustment difficulties at least once in their lives, as compared to only one of the care facility subjects.

In the residential care facility group, 52.5% of the participants had a history of clinically diagnosed psychiatric illness as follows: depression (six woman, three men), anxiety (one woman), sporadic psychotic episodes (one woman), bipolar affective disorder (one man), and alcohol abuse (five men). Two of the latter men carried dual diagnoses with the alcohol abuse, one with depression, the other with anxiety. Three additional male subjects, though not formally diagnosed, described periods of alcohol abuse early in life. Though four men experienced at least one hospitalization for alcoholism, the majority reported that they stopped drinking alcohol "cold turkey". Only one man reported

a recent history of alcohol use which was terminated when he entered the care facility two months earlier; the remainder had not drunk alcohol for at least one year, and most reported a 10 year or greater period of abstinence. None of the men who saw combat while in the service, whether residing in the community or care facilities, admitted to experiencing symptoms of post-traumatic stress.

Four of the community-dwelling participants (two men, two women) were taking an anti-depressant at the time of assessment, as compared to eight women and six men residing in care facilities. Additionally, one community-dwelling man was taking lithium, while one care facility woman was prescribed a low-dose anti-psychotic medication.

Level of depressive symptomatology across the entire sample, as assessed by the Geriatric Depression Scale (GDS), ranged from 0 to 20 endorsements out of 30, with a mean of 4.69 ($SD = 4.16$); the mean score fell within the range of scores considered "Normal" for the test (Yesavage et al., 1983). An independent group t -test revealed that mean level of depressive symptomatology did not differ significantly as a function of residential status ($t(78) = -.24, p > .10$, two-tailed). An evaluation of gender differences, however ($t(78) = -3.65, p < .01$, two-tailed), revealed that mean level of depressive symptomatology in the men was significantly higher ($M = 6.96, SD = 4.81$) than in the women ($M = 3.59, SD = 3.33$), though both average levels fell within normal limits. Associations between mood and demographic variables, as assessed by two-tailed Pearson product-moment correlations, revealed that level

of depression was not significantly associated with age ($r = -.15, p > .10$) or number of medical diagnoses ($r = .04, p > .10$) in this sample; there was a trend for symptom level to be positively and significantly associated with the number of prescribed medications, however ($r = .22, p < .05$).

Cognitive and Information Processing Measures

Information processing rate was assessed by performance on the WAIS-R Digit Symbol Substitution subtest (DSym). Scores represent the number of symbols correctly coded in 90 seconds. DSym scores for the group ranged from 7 to 59, with a mean of 28.99 ($SD = 11.90$). Cognitive functioning was measured with the Wide Range Achievement Test 3 (WRAT 3) Reading subtest and the Mini Mental Status Exam (MMSE). Raw reading scores were converted to standard scores with a mean of 100 and a standard deviation of 15; the scores were used to provide estimates of premorbid verbal functioning. Standardized reading scores for all the participants ranged from 79 to 117, with a mean of 101.03 ($SD = 9.43$), a score that falls in the Average classification of functioning. The MMSE addresses mental status, including orientation and short-term memory; inclusion criteria necessitated that subjects score 23 or above out of 30 on the test, a range of scores indicative of intact cognitive status. Mean MMSE score for the group was 27.55 ($SD = 1.98$) and ranged from 23 to 30. Table 4 presents the results of independent group *t*-tests evaluating differences in information processing and cognitive measures as a function of residential status; community-dwellers demonstrated statistically significant

greater scores on all measures as compared to residents of care facilities. There were no differences between women and men, however, in mean scores on DSym ($t(78) = .79, p > .10$, two-tailed), MMSE ($t(78) = 1.87, p > .05$, two-tailed) or WRAT 3 reading ($t(78) = 1.29, p > .10$, two-tailed).

Table 4

Residential Differences in Information Processing Rate and Cognition

	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
DSym					
Community	36.33	11.05	6.90	67.99	.01
Care Facility	21.65	7.37			
WRAT 3 Reading					
Community	104.13	7.61	3.10	72.40	.01
Care Facility	97.93	10.12			
MMSE					
Community	28.13	1.57	2.70	70.77	.01
Care Facility	26.98	2.19			

Note. $N = 80$. All p values are two-tailed.

Pearson product-moment correlations between the cognitive and information processing measures were determined using standard scores (see Table 5). Standard scores on DSym were significantly and positively correlated with those on the WRAT 3 Reading subtest and the MMSE; similarly, standard MMSE scores were significantly and positively correlated with standardized WRAT 3 Reading scores.

Table 5

Intercorrelations Between Cognitive Measures

	DSym	WRAT 3 Reading
DSym		
WRAT 3 Reading	.45**	
MMSE	.56**	.45**

Note. $N = 80$. ** $p < .01$, two-tailed.

Personality Variables

The NEO-FFI (Costa & McCrae, 1992) was used to assess personality as represented by the five global domains of Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A), and Conscientiousness (C). The NEO-FFI profile sheet provides standard T scores corresponding to a given raw score for each domain; these T scores have a mean of 50 and a standard deviation of 10. Thus, participants raw scores on each domain were converted to T scores which were used in these and subsequent analyses. Table 6 provides the descriptive statistics for each of the personality domains for all subjects. According to the NEO-FFI manual (Costa & McCrae, 1992), as a group, participants' scores fell within the Average range for the all domains, relative to the normative sample.

Table 6

NEO-FFI Descriptive Data

	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Neuroticism	46.03	7.73	26	67
Extraversion	50.56	7.99	29	65
Openness	45.84	8.52	29	65
Agreeableness	48.05	9.14	26	69
Conscientiousness	48.18	6.44	26	64

Note. $N = 80$.

Independent group *t*-tests (two-tailed) assessing differences in the five personality domains as a function of residential status demonstrated that community-dwellers were not significantly different than residents of care facilities in N ($t(78) = -1.07, p > .10$), E ($t(78) = 1.83, p > .05$), O ($t(78) = 1.47, p > .10$), A ($t(78) = 1.61, p > .10$) or C ($t(78) = -.59, p > .10$). Table 7 presents the results of independent group *t*-tests assessing gender differences in the personality factors: Men were no different than women in E or O. There was a trend for women to demonstrate slightly higher scores on C. The men's scores on N, which fell in the average range, were significantly greater than the women's scores, which fell in the low average range. Furthermore, the average level women's scores on A were significantly greater than the men's scores, which fell slightly below average.

Table 7

Gender Differences in Personality Domains

	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Neuroticism					
Women ^a	43.70	6.68	-4.27	78	.01
Men ^b	50.85	7.64			
Extraversion					
Women ^a	50.76	8.15	.32	78	ns
Men ^b	50.15	7.78			
Openness					
Women ^a	46.07	8.24	.36	78	ns
Men ^b	45.35	9.23			
Agreeableness					
Women ^a	49.96	8.35	2.81	78	.01
Men ^b	44.08	9.59			
Conscientiousness					
Women ^a	49.17	5.71	2.03	78	.05
Men ^b	46.12	7.44			

Note. ^a*n* = 54. ^b*n* = 26. All *p* values are two-tailed.

Pearson product-moment correlations between each of the personality domains are presented in Table 8. As indicated, several of the domains were statistically associated.

Table 8

Intercorrelations Among Personality Domains

	N	E	O	A
N				
E	-.25*			
O	-.06	.26*		
A	-.35**	.19	.24*	
C	-.33**	.26*	.07	.49**

Note. $N = 80$. * $p < .05$; ** $p < .01$, two-tailed.

Rorschach Responses

The means and distribution of those Rorschach variables hypothesized to have an association with information processing rate and personality variables are presented in Table 9. The determinants examined were: the total number of responses (R); the ability to organize elements of the environment into a meaningful impression as represented by the number of Whole responses (W); Human Movement (M) responses, which are associated with general intelligence; Zf , an index of the complexity of response mediation, or the effort expended to organize the stimulus field; conventionality as represented by the number of Popular responses (P); $F+\%$, the percentage of percepts that demonstrate a superior use of the contours, resulting in responses that the majority of individuals would have no difficulty seeing; and $X+\%$ and $X-\%$, two

components of the Extended Form Quality Distribution: $X+%$ represents perceptual accuracy, reflecting the percentage of percepts that do not violate the form demands of the blot, while $X-%$ reflects a distorted or statistically rare (as compared to the Exner (1990) normative sample) use of form. All community-dwelling participants produced at least one response to each of the 10 blots; two residents of care facilities rejected a blot apiece (Card IX and VI, respectively) while one participant exhibited two rejections (Card II and IX).

Table 9

Rorschach Determinants: Descriptive Data

	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
<i>R</i>	19.51	8.51	10	59
<i>W</i>	5.01	3.18	1	18
<i>M</i>	2.06	1.63	0	7
<i>Zf</i>	7.09	2.87	2	15
<i>P</i>	5.23	2.02	0	9
<i>F+%</i>	.60	.17	.17	1.00
<i>X+%</i>	.58	.13	.27	.88
<i>X-%</i>	.22	.12	.00	.67

Note. $N = 80$.

The results of independent *t*-tests evaluating differences in Rorschach determinants as a function of residential status can be found in Table 10. Mean scores of the community-dwelling participants differed significantly from the care

facility residents on *R*, *P*, and *M*, with the latter group tending to produce significantly fewer of all response types. The remainder of the *t*-tests were not significant. In addition, men did not differ from women on Rorschach determinants and scores: *R* ($t(78) = 1.60, p > .10$), *W* ($t(35.81) = -.89, p > .10$), *M* ($t(78) = .38, p > .10$), *P* ($t(78) = -1.94, p > .05$), *Zf* ($t(78) = -.47, p > .10$), *F+%* ($t(78) = -.24, p > .10$), *X+%* ($t(78) = -.57, p > .10$) and *X-%* ($t(78) = .18, p > .10$).

Table 10

Residential Status Differences in Rorschach Determinants

		<i>R</i>	<i>W</i>	<i>M</i>	<i>P</i>	<i>Zf</i>	<i>F+%</i>	<i>X+%</i>	<i>X-%</i>
<i>M</i>									
	Community	22.70	5.15	2.50	5.83	7.45	.62	.60	.21
	Care Facility	16.33	4.88	1.63	4.63	6.73	.59	.57	.22
<i>SD</i>									
	Community	10.15	3.54	1.75	1.69	2.69	.14	.12	.11
	Care Facility	4.80	2.81	1.37	2.16	3.03	.19	.14	.14
<i>t</i>		3.59	.38	2.49	2.77	1.13	.78	.87	-.44
<i>df</i>		55.59	78	78	78	78	71.09	78	74.41
<i>p</i>		.01	ns	.01	.01	ns	ns	ns	ns

Note. *N* = 80.

Table 11 shows the results of *t*-tests evaluating differences in Rorschach determinants between the present sample and Exner's (1990) normative sample. Exner's sample consisted of 700, primarily Caucasian (81%), nonpatient adults (50% male, 50% female) who were, as a group, very well educated (61% of the

sample has 13 or more years of schooling). The age of his normative sample ranged from 18 years to over 65 years, though only 19 out of the 700 persons (3%) were over 65 (the upper age limit was not reported) and only 5% of the sample fell in the 56 to 65 year range. Mean differences in Rorschach variables between the groups were statistically significant in all cases. Compared to Exner's normative sample, the present subjects gave fewer *R*, *W*, *P* and *M*; values for *Zf*, *X+%*, and *F+%* were also significantly lower, while the value of *X-%* was higher. Appendix B provides Exner's means and standard deviations for these Rorschach determinants.

Table 11

Rorschach Determinants: Normative Versus Sample Differences

	<i>t</i>
<i>R</i>	-3.13
<i>W</i>	-9.95
<i>P</i>	-7.37
<i>M</i>	-12.31
<i>Zf</i>	-14.72
<i>F+%</i>	-5.78
<i>X+%</i>	-14.01
<i>X-%</i>	10.83

Note. *N* = 80. *df* = 79 all tests. All *p* < .01 (two-tailed).

Clinically, Rorschach determinants and scores are not interpreted in isolation; thus, it has been recommended that meaningful configurations of scores providing multifaceted measures of the variables under study be used for research purposes (Weiner, 1995). Reducing the number of dependent variables also provides the practical function of attenuating the risk of alpha inflation attendant when numerous significance tests are conducted upon one data set. A factor analysis, using the eight Rorschach variables under consideration here, was therefore run.

Prior to computing the analysis, the suitability of the correlation matrix (see Table 12) for such a statistical method was determined using Bartlett's Test of Sphericity, a test recommended when factor analyses with an N of less than 100 will be run (Zillmer & Vuz, 1995). The Bartlett's sphericity χ^2 index of 251.71 ($p < .001$) fell within normal limits, and thus the null hypothesis that the correlation matrix was an identity matrix unsuitable for factor analysis was rejected. Initial factor extraction by means of a principal components analysis revealed 3 factors with eigenvalues ≥ 1 that accounted for 72.16% of the total variance. To achieve simple structure, the solutions were rotated by oblique rotation (promax), a technique useful in psychology where determinants of behavior, such as Rorschach scores, are rarely uncorrelated (Zillmer & Vuz, 1995).

Table 12

Intercorrelations Between Standardized Rorschach Variables

	<i>R</i>	<i>W</i>	<i>M</i>	<i>Zf</i>	<i>P</i>	<i>F+%</i>	<i>X+%</i>
<i>R</i>							
<i>W</i>	.07						
<i>M</i>	.17	.01					
<i>Zf</i>	.14	.75**	.39**				
<i>P</i>	.17	.04	.43**	.25*			
<i>F+%</i>	-.04	-.12	.16	.01	.34**		
<i>X+%</i>	-.17	-.17	.05	-.11	.37**	.77**	
<i>X-%</i>	-.06	-.04	-.03	.03	-.31**	-.48**	-.63**

Note. *N* = 80. **p* < .05; ***p* < .01, all two-tailed.

Table 13 shows the rotated factor pattern matrix for the eight Rorschach variables under study. The three factors can be described as follows: Factor 1, Perceptual Accuracy (ACC), primarily composed of *X+%*, *F+%*, and *X-%*; Factor 2, Holistic Organization (ORG), principally defined by loadings from *W* and *Zf*, and, Factor 3, General Response Process (RSP), characterized by loadings for *M*, *R*, and *P*. The intercorrelations among the three factors can be found in Table 14. Factor scores for the three components were determined by the regression method, resulting in a new set of factor score variables with a mean of 0. The three factor scores, named as above, were used as dependent variables in all subsequent analyses involving Rorschach performance.

Table 13

Factor Pattern Matrix (Promax Solution) for Rorschach Variables

	Perceptual Accuracy	Holistic Organization	General Response
<i>X+%</i>	.95	-.08	-.11
<i>F+%</i>	.85	-.04	.04
<i>X-%</i>	-.80	-.09	.08
<i>W</i>	-.006	.99	-.20
<i>Zf</i>	-.02	.87	.21
<i>M</i>	-.007	.02	.81
<i>R</i>	-.26	-.09	.67
<i>P</i>	.40	.05	.62

Note. *N* = 80. Bold face indicates factor to which item is allocated.

Table 14

Intercorrelations Among Rorschach Factor Variables

	Perceptual Accuracy	Holistic Organization
Perceptual Accuracy		
Holistic Organization	-.04	
General Response	.20	.25*

Note. *N* = 80. **p* < .05, two-tailed.

Relationships Between Variables: Statistical Analyses

Relationships Among Information Processing Rate, Mood, and Demographics

Hypothesis 1 predicted that older age, greater level of depression, and residence in a care facility would be associated with slower rates of information processing. Pearson product-moment correlations demonstrated that scores on DSym were not associated with GDS scores ($r = -.18, p > .10$, two-tailed) in this sample, although the direction of the relationship was as hypothesized. DSym scores were significantly associated with age ($r = -.49, p > .01$, two-tailed) and residential status ($r = -.62, p > .01$, two-tailed) as predicted, such that both advancing age and residence in a care facility were associated with less rapid rates of information processing. Controlling the health status variables did not attenuate the significant negative relationship between DSym and age ($r = -.50, p < .01$, two-tailed).

DSym scores also demonstrated statistically significant negative correlations with number of medical diagnoses ($r = -.44, p < .01$, two-tailed) and number of medications ($r = -.42, p < .01$, two-tailed). Partialling out the effects of these variables as well as age (since participants in care facilities were significantly older and had a statistically greater number of diagnoses and medications) still resulted in a significant semipartial correlation between DSym and residential status ($sr = -.43, p < .01$, two-tailed). While residency in a care facility per se was thus associated with reduced rates of information processing,

length of stay showed no relationship with DSym scores ($r = -.10$, $p > .10$, two-tailed).

Rorschach Variables and Information Processing Rate

It was predicted that the productivity and quality of Rorschach responses would be dependent upon the rate of information processing, as manifested through performance on DSym (Hypothesis 2). Specifically, it was hypothesized that subjects scoring higher on DSym would produce Rorschach protocols with more total (*R*), Whole (*W*), Human Movement (*M*), and Popular (*P*) responses, higher values for *Zf*, *F*+, and *X*+, and lower values for *X*-. Thus, in terms of the three factor score variables ACC, ORG and RSP, higher DSym scores were predicted to be associated with higher values for all three factors. This hypothesis was tested using simple linear regression, regressing each factor score in turn onto standardized DSym scores.

Information processing rate did not significantly predict scores on either ACC (beta = .14, $R^2 = .02$, $p > .10$) or ORG (beta = .15, $R^2 = .02$, $p > .10$). The regression of RSP on DSym, however, revealed a statistically significant positive association between the two variables (beta = .52, $p < .01$), with information processing rate accounting for 27% of the variance observed in Rorschach RSP.

Rorschach Variables and Personality

Based on the literature review, hypothesis 3 predicted that better Rorschach productivity and quality, as manifested in higher scores on factor variables ACC, ORG and RSP, would be associated with persons high in O, A,

E, and low in N. No relationship was expected with C. This hypothesis was tested using simple regressions, in which each dependent variable was regressed on each of the personality constructs in turn. Table 15 presents the results of these analyses examining Rorschach ACC. Only the regression using A as a predictor demonstrated statistical significance; the remainder of the regressions were not significant. Table 16 displays the results of regressing each personality domain on the Rorschach factor ORG. Only the regression of ORG on O was significant, with persons higher in O demonstrating greater scores on this factor, as predicted. The regression of RSP on the different personality constructs is presented in Table 17. As predicted, O was a highly, statistically significant predictor of the Rorschach factor variable RSP, with higher scores on the O scale associated with greater scores on RSP. The remainder of the regressions were not significant, although, there was a trend for persons higher in A to produce greater scores on RSP.

Table 15

Regression: Rorschach ACC on Personality Variables

	β	R^2	t	p
N	.00	.00	.03	.98
E	.05	.00	.43	.67
O	.03	.00	-.24	.80
A	.29	.08	2.67	<.001
C	.13	.02	1.13	.26

Note. $N = 80$. β = standardized regression coefficient; R^2 = coefficient of determination. $df = 78$.

Table 16

Regression: Rorschach ORG on Personality Variables

	β	R^2	t	p
N	.07	.01	.61	.55
E	.02	.00	-.13	.90
O	.28	.08	2.60	<.01
A	.02	.00	-.18	.86
C	.08	.00	-.60	.56

Note. $N = 80$. $df = 78$.

Table 17

Regression: Rorschach RSP on Personality Variables

	β	R^2	t	p
N	.10	.01	-.89	.38
E	.11	.01	.99	.32
O	.40	.16	3.86	<.001
A	.21	.04	1.89	.06
C	.08	.01	.70	.49

Note. $N = 80$. $df = 78$.

Rorschach Performance, Information Processing and Personality

Hierarchical multiple regressions were used to test the model of Rorschach response formation outlined by Blatt (1990) and others (Weiner, 1986) using the present variables. Thus, cognitive processes were represented by DSym scores and personality dynamics by each of the five personality factors under investigation. Hypothesis 4 predicted that information processing and personality would account, both individually and together, for a significant amount of the variance in Rorschach performance when both were used as predictors. In addition, the interaction of information processing rate and personality was investigated for each of the five personality factors.

In each of the hierarchical regressions, DSym and a given personality construct (i.e., N, E, O, A or C) were entered simultaneously as a set of main effects, followed by the appropriate two-way interaction (DSym X Personality

factor). Thus, for each dependent Rorschach variable (ACC, ORG and RSP), five separate regressions were run.

Table 18 presents the results of the respective regressions of ACC onto the five interaction terms. The only interaction that approached significance occurred when ACC was regressed on the DSym x O term. The latter interaction accounted for approximately 7% of the variance in ACC above and beyond that accounted independently by either DSym or O. Generally, however, as indicated by the values for *F*change, the addition of the remaining interaction terms into their respective regressions captured little unique variance.

Table 18

Regression: ACC on the Information Processing - Personality Interaction

	DSym x N	DSym x E	DSym x O	DSym x A	DSym x C
β	.10	-.20	-.26	-.04	-.02
R^2 change	.01	.04	.07	.00	.00
<i>F</i> change	.76	2.99	5.77	.11	.03
<i>p</i> change	.39	.09	.02	.74	.87

Note. *N* = 80. *df* = (3, 76).

The results of main effects testing are presented in Table 19. Only the regression including information processing rate and A approached significance, accounting for approximately 9% of the total variance in ACC. Inspection of the

semipartial correlation coefficients indicate that the majority of that variance was accounted for by A, whose main effect demonstrated a trend towards statistical significance. Information processing rate and N, E, O, or C, respectively, did not demonstrate significant contributions to the variance in ACC, either independently or when combined together as predictors. The values of the semipartial correlation coefficients, however, suggest that DSym scores were responsible for what variance was accounted for when N, E, O, or C were included in a respective regression equation.

Table 19

Regression: ACC on Information Processing and Personality - Main Effects

	N	E	O	A	C
Multiple <i>R</i>	.15	.15	.16	.30	.18
<i>F</i>	.88	.84	1.04	3.70	1.36
<i>p</i>	.42	.44	.36	.03	.26
DSym <i>sr</i>	.15	.14	.16	.06	.13
DSym <i>t</i>	1.32	1.22	1.42	.58	1.19
<i>p</i>	.19	.23	.16	.57	.24
Personality <i>sr</i>	.04	.03	-.08	.26	.12
Personality <i>t</i>	.36	.24	-.67	2.38	1.03
<i>p</i>	.72	.81	.51	.02	.30

Note. *N* = 80. *sr* = semipartial correlation coefficient. *df* = (2, 77).

The same hierarchical multiple regressions were repeated with the Rorschach ORG variable as the criterion. As before, DSym and a respective personality construct were entered as a set of main effects first, followed by the appropriate interactions terms. Results of the regression of ORG on each respective information processing rate by personality construct variable are presented in Table 20. None of the regressions of ORG on a given interaction term were statistically significant, though a trend was evident for the interaction terms formed by DSym and N, O, A, and C, respectively.

Table 20

Regression: ORG on the Information Processing - Personality Interaction

	DSym x N	DSym x E	DSym x O	DSym x A	DSym x C
β	.27	-.12	-.23	-.26	-.26
R^2 change	.07	.01	.05	.07	.06
F change	5.65	1.08	4.57	5.60	4.93
p change	.02	.30	.04	.02	.03

Note. $N = 80$. $df = (3, 76)$.

The results of main effects testing are presented in Table 21. Only the regression of ORG on DSym and O approached significance, with the latter combination of predictors accounting for 8% of the variance in ORG. Inspection of the semipartial correlation coefficients revealed that O, above and beyond

DSym, uniquely accounted for most of that variance (6%). In the remaining regression equations, neither the main effect of DSym, nor that of N, E, A, and C respectively, approached significance.

Table 21

Regression: ORG on Information Processing and Personality - Main Effects

	N	E	O	A	C
Multiple <i>R</i>	.19	.16	.29	.17	.17
<i>F</i>	1.44	.99	3.57	1.12	1.20
<i>p</i>	.24	.37	.03	.33	.31
DSym <i>sr</i>	.18	.16	.07	.17	.16
DSym <i>t</i>	1.59	1.41	.67	1.48	1.43
<i>p</i>	.12	.16	.50	.14	.16
Personality <i>sr</i>	.11	-.04	.25	-.07	-.08
Personality <i>t</i>	.99	-.35	2.27	-.60	-.71
<i>p</i>	.32	.73	.03	.55	.48

Note. *N* = 80. *df* = (2, 77)

Table 22 presents the results of regressing Rorschach RSP on each of the five information processing rate by personality construct interactions. None of the interactions were significant. Main effects testing can be found in Table 23. In all cases, regressions including information processing rate and a given personality construct as predictors of RSP were highly significant. DSym scores, in combination with O, accounted for 34% of the variance in Rorschach RSP process; when combined with either N, E, A, or C as predictors, DSym scores

accounted for 27% of the variance in each respective equation. Inspection of the semipartial correlation coefficients indicates that the majority of that variance was accounted for by information processing rate, whose main effect reached statistical significance in all 5 regression equations. The only personality construct which proved to be a significant predictor of RSP when combined with DSym in the equation was O.

Table 22

Regression: RSP on the Information Processing - Personality Interaction

	DSym x N	DSym x E	DSym x O	DSym x A	DSym x C
β	-.06	-.00	.06	-.02	.13
R^2 change	.00	.00	.00	.00	.01
F change	.33	.01	.45	.05	1.52
p change	.57	.93	.51	.82	.22

Note. $N = 80$. $df = (3, 76)$.

Table 23

Regression: RSP on Information Processing and Personality - Main Effects

	N	E	O	A	C
Multiple <i>R</i>	.52	.52	.58	.52	.52
<i>F</i>	14.02	14.03	19.22	14.24	14.05
<i>p</i>	<.01	<.01	<.01	<.01	<.01
DSym <i>sr</i>	.51	.51	.42	.48	.51
DSym <i>t</i>	5.20	5.17	4.46	4.89	5.24
<i>p</i>	<.01	<.01	<.01	<.01	<.01
Personality <i>sr</i>	.03	.03	.26	.06	.04
Personality <i>t</i>	.32	.34	2.78	.65	.37
<i>p</i>	.75	.73	<.01	.52	.71

Note. *N* = 80. *df* = (2, 77).

Additional Analyses

Supplementary analyses were conducted to further examine the existence and nature of any additional relationships among the study variables. Table 24 presents the Pearson product-moment correlations between Rorschach Perceptual Accuracy (ACC), Holistic Organization (ORG) and General Response Process (RSP) and selected demographic variables. As indicated, no statistically significant relationships were observed between ACC or ORG and age, years of education, estimated verbal intellectual ability (as represented by WRAT-3 reading scores), number of medical diagnoses or number of medications; there was a trend for current mental status (as represented by

MMSE scores) to be positively associated with ORG, but not with ACC. A trend was also observed between MMSE and the Rorschach RSP factor, such that higher mental status scores were associated with higher RSP scores.

Additionally, higher RSP scores were statistically significantly associated with younger age, fewer medical diagnoses and medications, higher WRAT-3 scores, and residence in the community. Holding age, medical history, medication regimen, and WRAT-3 reading scores constant, however (since all were significantly different in care facility dwellers as compared to community-dwellers), greatly attenuated the observed relationship between RSP and residential status ($r = -.15$, $p > .10$, two-tailed).

Table 24

Rorschach Performance and Selected Demographics: Correlations

	ACC	ORG	RSP
Age	-.00	-.07	-.30**
Education	-.03	.14	.07
WRAT-3	.13	.22	.31**
MMSE	.13	.23*	.24*
Medical Diagnoses	-.16	-.05	-.41**
Prescribed Medications	.10	-.16	-.34**
Residential Status	-.10	-.08	-.43**

Note. $N = 80$. * $p < .05$; ** $p < .01$, two-tailed.

The relationship between age and General Response Process (RSP) was examined further in connection to DSym scores, which had been shown to decrease with advancing age in this sample. Thus, Rorschach RSP was regressed on DSym and age. Independently, information processing rate accounted for 27% of the variance in RSP ($r = .52, p < .01$, two-tailed). Entering age into the equation next resulted in a non-significant change in R^2 of .00 ($F(2, 77) = .25, p > .10$). Thus, accounting for information processing rate reduced the magnitude of the influence of age on Rorschach RSP.

DISCUSSION

Sample Selection and Response Rate

Recruitment of subjects from the community proved to be challenging. Originally, fliers asking for participation in a study investigating psychology and aging were posted in several residential complexes geared towards seniors and in a hospital volunteer organization staffed primarily by persons over 65 years of age. Response rate was poor, yielding just two participants from these sources. Several more participants were referred by friends or relatives of colleagues of the author; several of these subjects in turn served as contacts for additional subjects by word-of-mouth. In the end, however, the majority of the community dwelling subjects were recruited from two parishes of the Seventh Day Adventists faith. Permission to recruit in the church, which had a large membership of older adults, was obtained through a member who was well known to the investigator and who announced the study in several meetings and in a newsletter. Even still, 57% of the persons contacted refused to participate.

It is well known to researchers in the field that community-dwelling older adults are often difficult to locate for research participation (Williams, Vitiello, Ries, Bokan, & Prinz, 1988). In the present study, persons contacted for inclusion were asked what factors influenced their decision to participate. Most persons refusing participation tended to cite being too busy to take part in the research, though several admitted to disinterest. There was some indication among non-participants and subjects alike, however, that the topic under

investigation made them uncomfortable. Specifically, several of the subjects reported a fear that the assessment would show them to be “crazy” or otherwise mentally unfit. Almost 20 years ago, it was suggested that the then current generation of older adults belonged to a cohort of individuals lacking psychological mindfulness (Kulka, Veroff, & Douvan, 1979); this would still seem to be the case, at least for many of the persons contacted for the present study.

It must be noted that the primary source of the community-dwelling participants may limit the representativeness of the results. According to the members interviewed, the Seventh Day Adventist religion advocates a healthy lifestyle in which alcohol use is prohibited and a healthy diet and exercise are encouraged as part of the faith. Though members were not asked how long they had belonged to the faith (and hence followed the lifestyle), and though several members admitted to the occasional glass of wine, it is possible that these subjects are healthier than their average counterparts in the community.

Gaining permission to collect data from the three residential care facilities participating in the study was a relatively straightforward, though lengthy process, reflecting each site’s desire to safeguard the rights of their residents. In all cases, the investigator’s previous experience at each facility helped to garner approval, as did the fact that all subjects had to be capable of giving their own informed consent. The greatest hindrance to individual subject recruitment was the level of impairment of most of the residents. For example, of the 231 women residing across the three facilities, only 40 were felt by social workers to possess

adequate cognitive, motor and visual capabilities to complete the battery. At the Home for Veterans, only 24 men were nominated, despite a male population numbering 613. The refusal rate among the care facility group ran about 25%, less than that observed with the community-dwelling participants. Fewer opportunities for intellectual stimulation and/or social interaction are not uncommon in care facilities (Camp, West, & Poon, 1989), a fact of residential life brought up by many of the participants and perhaps accounting for their greater likelihood of participation, as compared to community-dwelling individuals.

Many of the community-dwellers reported leading active lives populated by friends and relatives and filled with volunteer work and/or recreational pursuits. Yet, they were as apt to want to “chat” with the investigator, both during and following completion of the formal battery, as were the residents of the care facilities. Indeed, the same subjects who complained of fatigue during the assessment and were relieved when the last measure was administered were never too tired to talk with the examiner upon its completion. Since all the participants were donating their time for the study, the examiner was happy to oblige the subjects’ penchant for showing family pictures or crafts they had made. This, however, added 30 minutes to one hour to the two to three hours needed for completion of the formal battery.

It has been observed that older persons are often more loquacious during a psychological assessment than younger persons (Storandt, 1994), and that this verbosity is unrelated to loneliness but is related to extraversion (Gold, Andres,

Arbuckle, & Schwartzman, 1988), at least in community-dwelling Canadian men. As a group, the present subjects were average in Extraversion, with individual scores on this domain of the NEO-FFI ranging from low to high average; nonetheless, the desire for conversation was evident in almost all subjects. Furthermore, loneliness and a lack of personal social interaction did appear to contribute to the loquaciousness of the care facility residents. Thus, the factors affecting this behavior may be related both to gender (since women outnumbered men about 3:2) and to residential status, at least in the present group.

Demographic Variables

Originally, an attempt was made to recruit 10 subjects in each of four age bands (65-70, 71-75, 76-83, and over 83 years) in each residential group in order to ensure a continuum of age intervals representing the youngest to the oldest old (Neugarten, 1975). This eventually proved to be impractical, as it would have meant turning away willing volunteers and waiting for non-existent participants. In the end, however, age was normally distributed across the sample and spanned 29 years from youngest to oldest, with a mean of 80 years. In accordance with the literature, the residents of care facilities were significantly older, as a group, than were the community-dwelling subjects; their average age of just over 82 years is slightly higher than the national average for this population (U.S. Senate Special Committee on Aging, 1996). Moreover, all

the nonagenarians in the sample (11 women) were recruited from the care facilities.

According to 1990 U.S. Census data, only 25% of older adults have more than 12 years of schooling. Relative to the general population then, this sample may be somewhat atypical; though the average length of schooling for both residential groups was 12 years, 47% of the subjects reported some post-secondary education and 28% had university degrees. The study participants also differed from the general population in terms of ethnic diversity. Save for two women, the entire sample was Caucasian. Both the education and ethnicity factors, then, impose limits on the generalizability of the results.

Mean length of residency for the care facility group was similar to the 2.5 years reported in the literature (Streim et al., 1996). Not unexpectedly, nursing home residents were both more ill and prescribed a greater number of medications than the community-dwelling participants. It should be noted, however, that formal medical histories were available only for the care facility group. In several instances, community-dwellers reported no illness but did report taking prescribed medication obviously intended for a diagnosed condition. In addition, community-dwellers may have been unaware of the existence of any forms of non-debilitating, asymptomatic disorders. For instance, osteoporosis, a common disorder in older women, was a diagnosis found only among care facility residents. Concomitantly, however, a tendency for residents of a given home to

all be diagnosed with disorders common to aging, perhaps representing the bias of the attending physician(s), was also observed.

Only four women and one man, all community-dwellers, reported no medical conditions. Thus, almost 94% of the sample had at least one medical diagnosis, slightly higher than the 80% expected (La Rue & Markee, 1995). Cardiac abnormalities were one of the most frequent medical diagnoses amongst both community-dwellers (45%) and residents of care facilities (52.5%); hypertension was also common. Significant relationships between hypertension or heart disease and performance on various neuropsychological measures have been documented (Abrahams & Birren, 1983; Elias, Robbins, Schultz, & Pierce, 1990; Hertzog, Schaie, & Gribbin, 1978; Sands & Meredith, 1992). Additionally, correlational research has demonstrated that health can account for a greater proportion of individual differences in older rather than younger adults' cognitive performance (Permuter & Nyquist, 1990). Thus, consideration of health status in general is important, given the information processing focus of the present investigation.

Salthouse and his colleagues (1990; 1992b) found that controlling for health status, as measured by self-reported ratings, did not attenuate the age-associated decline in digit symbol performance; similarly, there was no interaction between age and health status in these studies. While it would be easy to conclude from this work that health status per se has little influence on information processing rate, different results have been obtained in studies

examining specific diagnostic groups. For example, poorer digit symbol performance was evident in a group of older adults with non-insulin dependent diabetes mellitus, relative to their age-matched, healthy counterparts (Perlmutter, Tun, Sizer, McGlinchey, & Nathan, 1987; Tun, Perlmutter, Russo, & Nathan, 1987). Consideration of other diseases have yielded conflicting results. Sands and Meredith (1992) found that blood pressure status was not predictive of digit symbol performance over time, although it did influence verbal digit span performance. In other research, Mitrushina and Satz (1990) found no significant difference in digit symbol performance between older adults with and without presumable cardiovascular disease; differences were found, however, on more complex mental operations involving decision making in novel situations. In the present study, poorer digit symbol performance was associated with increasing age, as well as with increasing numbers of medical diagnoses and medications prescribed. As in the Salthouse study, however, controlling for the two health status variables did not attenuate the negative relationship between information processing rate and age.

Interestingly, one community-dwelling woman and three women in care facilities had diagnoses of mild dementia. It is unknown what criteria these diagnoses were based upon. Inclusion criteria for the study demanded that subjects score above the cut-off for dementia on the MMSE, which these women did. Additionally, digit symbol substitution tasks are sensitive to any type of brain damage (LeFever, 1991); again, these women were able to compete the digit

symbol test independently. Of course, a complete neuropsychological evaluation was not part of the present investigation. It is possible that other neuropsychological testing, particularly of memory, would have supported such diagnostic conclusions. Regardless, the potential presence of the dementing illnesses, as well as the five documented cases of Parkinson's Disease and the 10 CVA histories, indicates that information processing rate may have been confounded with disease process, at least in these subjects.

Depression

The distribution of the severity of experienced depressive symptomatology in the sample, based on published cut-off scores for the GDS (Yesavage et al., 1983), was as follows: 86.3% within normal limits and 12.5% mild symptomatology; only one subject, a man, scored in the severely depressed range. Mean level of depressive symptomatology (approximately 4/30 endorsements) did not differ as a function of residential status, but did differ as a function of gender. Nevertheless, the mean level of depressive symptomatology fell within normal limits for both sexes. Fourteen residents of care facilities were on anti-depressants, as compared to only four community-dwellers. Thus, while clinically significant symptoms were absent in the subjects at the time of assessment, care facility participants were more apt to be formally diagnosed with depressive disorder. While this may reflect the higher incidence of depression amongst older adults in care facilities (Streim et al., 1996), it may also reflect the fact that the physicians attending such residents are more alert to

such symptomatology. It is not uncommon in the current generation of older adults, given problems with psychological mindfulness, to present psychological distress as physical symptoms (Schaie & Willis, 1991), making it more challenging to accurately uncover the nature of presenting symptoms, especially for practitioners not familiar with this population.

Information Processing Rate and Cognition

Results of the WRAT-3 Reading subtest indicated that premorbid verbal abilities fell in the Average classification of functioning for both residential groups, even though there was a statistically significant difference in mean scores; this suggests that participants were comparable in terms of verbal intellect. Similarly, while current mental status, as measured by the MMSE, did differ as a result of residential status, the mean scores of both groups fell in the intact range. Adopting a more liberal cut-off criterion resulted in the inclusion of three subjects, all residents of care facilities (and all scoring 23/30), who would normally be considered to be experiencing mild cognitive impairment (Folstein et al., 1985). As found in the Osterweil et al. (1994) study, however, 1/3 of an older non-demented care facility population (mean age 88.9 years), scored 23 or below and all were functioning well in an independent manner within the living environment. Even some of the younger residents in that study (average age 80.4 years) scored below the impairment cut-point of 24. In the present case, the residents earning 23/30 points were 73, 76, and 86 years of age. Mental

status for the whole group, then, was comparable across residential status, with all subjects considered cognitively intact.

The mean score of approximately 29 earned by the total sample on the WAIS-R Digit Symbol Substitution (DSym) subtest corresponds to a standard score of 4 (Wechsler, 1981), a performance falling below the first percentile of the young (20-34 years) normative reference sample. When compared to the oldest provided reference group of 70 - 74 years, however, a standard DSym score of 10 (50th percentile) is obtained. As a group, then, information processing rate fell in the Average classification, even amongst adults older than 74 years. Processing rate did differ as a function of residential status, however; care facility residents earned a mean standard score of 8 (as indexed against the 70 -74 year reference group), relative to the mean standard score of 11 earned by participants residing in the community.

It should be noted that, while the digit symbol task was administered according to standard procedures as outlined in the WAIS-R manual (Wechsler, 1981), all subjects filled out a version that was enlarged to legal size (i.e., 8 x 14 inches). As reviewed by Storandt (1994), visual changes common to aging, such as decreases in acuity and difficulty in reading small print, can compromise performance on psychological measures. All the subjects had to have sufficient visual ability to complete all assessment measures; in order to accommodate potential individual differences, however, the digit symbol stimuli were enlarged

for everyone, to ensure that what was being assessed was indeed information processing rate and not difficulties with vision.

Personality

Community-dwellers did not differ from residents of care facilities in the personality attributes of Neuroticism, Extraversion, Openness, Agreeableness, or Conscientiousness, as assessed by the NEO-FFI. Relative to the normative data base for the inventory, which provides norms for both 500 men and 500 women ranging in age from 21 to 95 years (Costa & McCrae, 1992), the present subjects scored within the average range for all personality domains. Costa and McCrae (1992) report that women tend to score higher than men on Neuroticism and Agreeableness, though the differences tend to be modest in magnitude. In the present sample, women's scores were indeed significantly greater on Agreeableness; in contrast, women demonstrated significantly lower scores on Neuroticism as compared to the men. The men in this study endorsed significantly more symptoms of depression than the women; since Neuroticism is a measure of the tendency to experience negative affects, the greater scores demonstrated on this domain by the men may have been a function of their affective status.

Rather than have each subject read and complete the NEO-FFI themselves, the examiner read the inventory to subjects and marked down their responses for them, an amendment allowed in the standard procedure of administration. This was done both in the interest of time, and because, in

clinical practice, it has been the investigator's experience that older adults find filling and tracking their answers on the small print response sheets visually taxing.

Early into the investigation, it became apparent that many subjects found it difficult to respond to negatively keyed statements, such as "I am not a worrier". According to the manual, a sixth grade reading level is adequate to complete the inventory (Costa & McCrae, 1992). Results from the WRAT-3 Reading subtest indicate that, as a group, subjects were reading at a high school level. It appears that the difficulty arose when choosing one of the five possible responses, which ranged from strongly agree to strongly disagree, when confronted with the negatively keyed statements. This was observed despite the fact that a sheet listing the five choices was provided to each subject during the test with explicit instructions to choose one for each statement. Many subjects tended to state "Yes, I am..." or "No, I'm not..." as responses, or, alternatively, "True" or "False". It was also not uncommon for subjects to ask something akin to "If it says I'm not, and I am, then shouldn't I agree?". Also apparent was a tendency for many of the subjects to ignore the "not" in a phrase and respond as if the statement was positively keyed. Fortunately, because these difficulties were observed early on, potential confusion regarding a subject's response was avoided by asking for elaboration.

Rorschach Performance

In concordance with the literature examining the quality and quantity of Rorschach responses in older adults, significant differences between the present sample and Exner's (1990) standardization group were observed. Specifically, this sample offered significantly fewer total (*R*), Whole (*W*), Human Movement (*M*) and Popular (*P*) responses. Similarly, significantly lower scores were demonstrated for organizational activity (*Zf*), good Form Quality (*F*+%), and good perceptual accuracy scores (*X*+%), while poor perceptual accuracy scores (*X*-%) were higher. The fewer *R*, *M*, and *P* responses, as well as the lower scores on *F*+%, support the results of the literature reviewed by Reichlin (1984).

The scores of *X*+% or *X*-% have not been examined in the older adult Rorschach literature. In this sample, both *X*+% and *X*-% were significantly correlated with *F*+% ($r = .77$ and $r = -.48\%$, $p < .01$, respectively), as well as with each other ($r = -.63$, $p < .01$). All three scores describe how well responses conform to the form demands of the blot; while *F*+% deals specifically with responses which are purely form dominated, the extended form quality scores of *X*+% and *X*-% address the issue for all responses where form is at least one component of the percept. Not unexpectedly, subjects with high *F*+% tended to demonstrate good form on the remainder of the blots; hence the positive correlation between it and *X*+%. With respect to the extended form quality scores, because both scores are based on total response number, when *X*+% is high, *X*-% is usually low, and vice versa; hence the strong negative correlation

between the two scores. Since $F+\%$ was significantly lower in this sample, relative to Exner's normative base (1990), and given the aforementioned interrelationships, it is not surprising that $X+\%$ was also lower, and $X-\%$ was higher.

Exner's score of Zf has also not been examined previously in the geriatric Rorschach literature; indeed, Exner (1996) has stated that, "The scoring for organizational activity has been one of the most neglected of the Rorschach components " (p. 141). Assigning a Z score depends on the meaningfulness of the organization of a percept; they are assigned only in percepts that include form and are either W responses, responses that integrate two detail areas (adjacent or nonadjacent), or responses that integrate white space meaningfully into the percept. For most of the cards, responses earning Z scores demand more cognitive effort and organizing activity on the part of the subject. Not surprisingly given the criteria of assignment, Zf scores were strongly and positively correlated with W in this sample ($r = .75, p < .01$). A significant positive association was also demonstrated between Zf and M in this sample ($r = .39, p < .01$), supporting results obtained by Exner, Viglione, and Gillespie (1984) in a younger adult sample. Projecting human movement into a percept is thought to demand reasoning, imagination and higher forms of conceptualization (Exner, 1986); hence producing an M response also requires greater and more complex cognitive processes. Given the intercorrelations amongst these components, and the result that both W and M occurred less frequently in the sample than in

Exner's (1990) normative base, the fact that *Zf* was also significantly lower in the present sample is not unexpected.

Across the studies reviewed, *W* tended to increase with age; in this sample, the frequency of *W* responses was significantly less than that reported in Exner's (1990) normative sample. Of course, *R* was significantly less as well; thus, it might be tempting to conclude that the fewer total responses decreased the probability of observing a *W* response (or for that matter, an *M* or *P*). An examination of the ratio of *W* to *D* (responses delivered to discrete detail areas of the blot), however, indicated that many subjects were more apt to deliver *D* or *Dd* replies. Forty-nine of the 80 protocols evidenced *W:D* ratios of 1:2 or more, with 37 of the that group demonstrating ratios of 1:3 and greater. It is noteworthy, however, that most nonpatient adults give more *D* than *W* answers (Exner, 1986); thus, in this respect, the present older adults Rorschach behavior was similar to Exner's normative group qualitatively, if not quantitatively.

Community-dwelling participants differed significantly from participants in care facilities with respect to *R*, *M* and *P*. Specifically, community women tended to produce more of all these response types than their counterparts living in care facilities. The lower *P* and *M* may be a function of a lower *R*. These three determinants did load onto one factor, which was named the General Response Process (RSP) factor. In general, the variables composing this factor address several aspects of responding, including productivity (*R*), perceptual conventionality (*P*), and imagination and cognitive effort (*M*).

The Rorschach was administered following Exner's guidelines with the exception of one requirement. According to Exner's rules, a protocol with less than 14 responses may be not be interpretively valid . In such cases, the examiner should normally re-administer the response phase before proceeding to the inquiry, during which the features influencing response formation are explicated. In the present sample, though six subjects produced fewer than 14 responses, the response phase was not re-administered. The reason for this was two-fold: (1) From the perspective of the research, the number of responses a subject would spontaneously generate in one administration was of interest, and (2) In previous research (Domitrovic, 1994) and clinical work with the Rorschach, it has been my experience that re-administering the test results in few, if any, additional responses. Instead, re-administration tends to result in a subject who is defensive and with whom rapport is taxed.

Relationships Between Variables

Information Processing Rate, Mood, and Demographics

The results of Hypothesis 1 indicate that, with the current sample, level of depressive symptomatology was not associated with information processing rate. This is not surprising, given that, as a group, the present subjects did not express a clinically significant level of depressive symptomatology. Furthermore, eight of the nine subjects demonstrating mildly elevated levels of symptomatology scored just outside of normal limits. While studies have demonstrated that elderly depressed adults can show deficits on neuropsychological testing, including

slower rates of information processing, such subjects are usually suffering from clinically diagnosed major depressive episodes with attendant symptoms greater in number and severity (see Lezak, 1995 for a review). Even when observed, cognitive deficits are relatively mild for most depressed older adults (Kaszniak & DiTraglia Christenson, 1994).

In accordance with Hypothesis 1, scores on the digit symbol substitution subtest were significantly correlated with age and residential status, such that advancing age and residence in a care facility were both associated with decreased rates of processing information. This result was found despite the fact that care facility participants were generally equated with community-dwelling subjects in years of education, estimated premorbid verbal intelligence, and current mental status, all variables which could have potentially explained the observed association. Of course, participants in care facilities were significantly older, as well as more ill and taking more prescribed medications than subjects in the community. Nevertheless, controlling for age, health and medication status attenuated the significant negative relationship between residential status and information processing rate only slightly.

The latter result is similar to that observed by Winocur and colleagues (1983, 1990, and 1996), where residents of care facilities tended to perform more poorly than their community-dwelling counterparts on various neuropsychological tests, despite the fact that subjects were equated on health, age, education, and socioeconomic status, and IQ was controlled. A separate study (Winocur et al.,

1987) found that cognitive function could vary longitudinally as a result of adjustment to the care facility environment. Though adjustment was not formally assessed here, longer-stay residents presumably would have had more time to adjust to residential life. In the present sample, however, there was no association between length of residency and information processing rate.

Another hypothesis suggested by Winocur and Moscovitch (1990) for the poorer performances of their care facility group, was that, though appearing to be cognitively intact, individuals may have been in a state of decline upon admission and that institutionalization either continued or exacerbated this course. The MMSE has proven to be a reliable and valid instrument in the detection of cognitive impairment, but it is only a screening instrument. Thus, it is possible that testing of a broader array of neuropsychological functioning would have shown care facility residents to be more cognitively impaired than either their mental status or their level of practical functioning indicated, and that this could help explain the association between information processing rate and residential status.

It should be noted that, of the neuropsychological functions examined in the series of studies by Winocur and colleagues, information processing rate *per se* was not included. Data from the Canadian Study of Health and Aging (Steenhuis & Østbye, 1995), however, did find that residents of care facilities performed more poorly on the WAIS-R digit symbol substitution task as compared to community-dwelling older adults. This result was observed even

when severity of cognitive deficits (groups studied either demonstrated dementia, cognitive loss without dementia, or no cerebral pathology) was controlled. The authors did not comment specifically on information processing rate, but noted that since the different residential groups differed on other visuospatial tasks as well, perhaps unmeasured discrepancies in sensory function were to blame for decreases in visuospatial functioning.

Rorschach Variables and Information Processing Rate

Researchers of the Rorschach have been encouraged to employ clusters or configurations of variables that combine to provide multifaceted measures of the variables under study; this is because in clinical practice, meaningful inferences from the test are based upon conjoint examination of the determinants and their relationship to one another (Weiner, 1995). Thus, in the remainder of the analyses examining Rorschach performance, the three factors of Perceptual Accuracy (ACC), Holistic Organization (ORG), and General Response Process (RSP), which resulted from a principal components analysis of the eight Rorschach scores and determinants under current study, were used as dependent variables.

Hypothesis 2 predicted that faster rates of processing information would be associated with better Rorschach performance as exemplified by higher scores on the factor variables of ACC, ORG and RSP. This was the case only for the factor variable RSP, principally defined by *R*, *M*, and *P*, and representing a complex variable defined by productivity, perceptual conventionality, and

creativity. Despite the statistical significance, however, Digit Symbol scores accounted for only 27% of the variance observed in RSP. This is likely because the cognitive component of forming a Rorschach response is a complex task demanding not only information processing, but scanning and visuospatial abilities, concept formation, and adequate verbal and communicative skills (Perry, Potterat, Auslander, Kaplan, & Jeste, 1996).

The complexity of Rorschach response formation may be responsible for the non-significant correlation observed between information processing rate and the Holistic Organization factor (ORG). The factor ORG was primarily composed of the Rorschach variables *W* and *Zf*, variables considered to represent complex holistic processing, ideation and integration (Exner et al., 1996). While the processing of information is a prerequisite for all cognitive acts, it may be that the ORG variable represents higher order cognitive functions not captured solely by scores on the digit symbol task; hence, the lack of a significant association in the present study.

Information processing rate was not associated with the Perceptual Accuracy (ACC) factor, determined essentially by *F*+%, *X*+% and *X*-%, either. Again, while responding to an inkblot demands the processing of information, it could be that some other visuospatial operations primarily underlie this variable, thought to represent the perceptual accuracy with which blots were translated. A recent study examining Rorschach performance in relation to neuropsychological functioning found that a similar factor variable, composed of *P* in addition to the

three form quality percentages, was not associated with either a verbal-comprehension or motor/visuospatial factor in a group of 190 psychiatric patients (Zillmer & Perry, 1996). In other research, 60 subjects suffering from moderately severe closed head injuries demonstrated scores on $X+\%$, $F+\%$, and $X-\%$ that were no different than those seen in Exner's (1990) normative sample (Exner et al., 1996). Thus, it may be that the mediation of the blots, a process represented by the form quality distribution (Exner, 1990), may only be compromised with severe and/or focal injuries to areas of the brain responsible for visuospatial integration; hence, the lack of association between Perceptual Accuracy and information processing in this group of cognitively intact older adults.

Rorschach Variables and Personality

Hypothesis 3 predicted that better Rorschach quality and productivity, as represented by higher scores on the factors Perceptual Accuracy, Holistic Organization, and General Response Process, would be found in persons high in Openness, Agreeableness, and Extraversion, and low in Neuroticism; no relationship was expected with Conscientiousness. Results varied somewhat, depending upon the criterion variable examined. Only persons high on Agreeableness demonstrated statistically significant higher scores on the factor variable ACC, with this domain predicting 8% of the variance observed in perceptual accuracy; no significant relationships were observed with the other personality factors. When the Holistic Organization factor was regressed on the five individual personality factors, only Openness demonstrated a significantly

positive association, accounting for 8% of the variance in integrative responding. Likewise, when General Response Process was regressed on personality, a significant association was again found only with Openness, which predicted 15% of the variance observed in that factor variable.

As the literature review indicated, the five factor model of personality has not been previously examined in relation to the Rorschach. The present study suggests that, at least in this sample of older adults, Rorschach response formation was influenced, to some extent, by how agreeable and open to experience an individual was. This relationship was stronger for the General Response Process factor than for either Perceptual Accuracy or Holistic Organization, perhaps reflecting the different aspects of response formation that these variables represent. Though all three factors are composed of determinants and scores purported to be related to the processing, mediation, and ideation of the blots (Exner, 1986; Exner et al., 1996), the Perceptual Accuracy factor probably represents the most “purely” cognitive variable since $F+\%$, $X+\%$ and $X-\%$ reflect the degree to which percepts conform to the form demands of the blot and whether or not they violate reality. In contrast, both the factors of Holistic Organization and General Response Process are composed of Rorschach variables that can be influenced to a greater extent by stylistic tendencies (i.e., R , W , M and Zf). For example, low R records are not uncommon in adults who are intellectually limited or neurologically impaired (Exner 1986; Exner et al., 1996; Perry et al., 1996), highlighting the cognitive

component of this Rorschach variable. Concomitantly, however, low *R* records can indicate resistance or defensiveness (Exner, 1985); while the latter can be situationally induced, it can represent a personality style of an individual. Thus, perhaps the domain of Openness was more related to the General Response Process factor than to Holistic Organization because the former variable is more influenced by personality processes.

Openness to experience is believed to be composed of several different elements, including an active imagination, intellectual curiosity, and attentiveness to inner feelings, and scores on this domain have been found to be modestly associated with education and measured intellect (Costa & McCrae, 1992). It is of note that several of the Rorschach variables under study, particularly *R*, *W*, and *M*, have been found to be associated with creativity and intellect, though the results across studies have been equivocal (see Exner, 1996 for a review). Agreeableness, found to be associated with Perceptual Accuracy but not with General Response Process or Holistic Organization, is thought to represent an interpersonal tendency to be sympathetic to others and eager to help them (Costa & McCrae, 1992); thus, it is possible that the relationship observed here was due to a social desirability effect; that is, people eager to please the examiner approached the task with more interest and/or attention. Why this relationship would then emerge only with the Perceptual Accuracy factor, however, is unclear.

In this older adult sample, the remaining personality domains were not associated with the aspects of Rorschach performance examined. This does not mean, of course, that personality is of no consequence in forming a response. Rather, it supports the results of research examining relationships between the Rorschach and other “objective” self-report personality tests, such as the MMPI. As reviewed by Archer and Krishnamurthy (1993), interrelationships between the MMPI and Rorschach variables have been minimal, a finding recently replicated in Zillmer and Perry’s (1996) factor analytic study. Meyer (1992) has pointed out that self-report inventories in general assess cognitive schemata about the self, whereas the Rorschach yields tacit, less consciously mediated processes. Similarly, Dies (1995) has argued that both objective and projective personality measures furnish a glimpse of the individual, but that self-report measures reflect the capacity to create certain impressions when the “...cues are clear as to what behaviors are expected by others” (p. 36). In contrast, the Rorschach makes it difficult to inhibit the expression of underlying liabilities or faulty means of conceptualizing or processing information, especially when individuals are psychologically troubled (Dies, 1995). The lack of association between most of the NEO personality domains and the Rorschach found here, then, emphasizes the unique, problem-solving nature of this task, with its contributions from both cognitive and personality realms.

Rorschach Performance, Information Processing and Personality

The intent of this study was to examine Rorschach response formation in older adults by decomposing and examining the process and its component aspects of cognition and personality. In actual fact, of course, the perceptual and representational (Blatt, 1990) processes involved occur simultaneously.

Hypothesis 4 tested this premise, predicting that information processing rate and a given personality domain would account, both independently and together, for a significant amount of variance in the factors of Perceptual Accuracy, Holistic Organization, and General Response Process when entered together in a regression equation. Because there was no a priori reason to expect a greater influence of processing speed over personality (or vice versa) on Rorschach response formation, digit symbol scores and a given personality factor were entered simultaneously as a set of main effects.

Statistical testing indicated that the combination of information processing rate and a given personality domain did not account for a significant amount of the variance in the factor variable Perceptual Accuracy, though there was trend observed with Digit Symbol scores and Agreeableness, with the latter combination of scores accounting for 9% of the variance in this variable. Inspection of the semi-partial correlation coefficients indicated that most of the variance was accounted for by Agreeableness, suggesting that the rate with

which one processes information has little to do with how accurately perceptual information is processed, at least in this sample.

Different results were observed with Holistic Organization. When information processing rate and personality were entered together, only the equation containing digit symbol scores and Openness approached statistical significance. Furthermore, it was the level of Openness, and not information processing rate, that demonstrated a trend towards capturing a significant amount of the variance in the Holistic Organization factor when both were in the equation together. As with the Perceptual Accuracy factor, the results suggest that personality processes, in particular Openness, have a greater influence on holistic processing and integration than rate of processing information.

In contrast to the results observed with the factor variables Perceptual Accuracy and Holistic Organization, information processing rate and a given personality construct predicted a significant amount of the variation in the General Response Process factor in all cases. Thus, Digit Symbol scores and Openness accounted for a highly significant 34% of the variance in General Response Process, while digit symbol scores and Neuroticism, Extraversion, Agreeableness, and Conscientiousness, respectively, accounted for 27% of the variance in general responding. In all cases, it was information processing rate that independently contributed a significant amount of the variance to the factor of General Response Process; only the personality factor Openness also predicted a significant amount of the variance as well.

Overall, these results highlight the difference in nature of the Perceptual Accuracy, Holistic Organization, and General Response Process variables. In general, the multiple regression analyses indicated that there was a trend for personality processes, in particular Agreeableness and Openness, to make a greater contribution to Perceptual Accuracy and Holistic Organization, respectively, when information processing rate was also considered. In contrast, information processing rate was a unique predictor of the factor variable General Response Process, regardless of the personality domain, though Openness was also a significant predictor. These results suggest that, for this sample of older adults, being open to experience was the key personality factor to better and more productive protocols, as least as defined by the General Response Process variable. Since the other domains demonstrated no association with General Response Process (RSP), it would appear that those personality qualities were not as important to the aspects of the responding represented by the RSP factor variable.

The latter analyses were an attempt to statistically test the contributions of perception and representation to the Rorschach task, especially in regard to the five-factor theory of personality. As such, the contribution of each personality domain was considered. In reality, of course, people are not just open to experience, or disagreeable, or extraverted. Everyone's personality is a composite of all five domains in varying degrees, and no one is devoid of any factor. For example, one might be low in agreeableness, but one does not lack

the characteristic altogether. In the end, it is this unique combination of an individual's personality that interacts with cognitive processes to form a Rorschach response. This is likely the reason that even when information processing and personality accounted for a statistically significant proportion of the variance in Rorschach performance, over half of variance was still left unaccounted for. Teasing out the factors that may influence Rorschach response formation is not unimportant, especially with groups such as older adults, who perform differently than younger adults on many psychological tests. This research, however, again emphasizes the complex processes involved in responding to a Rorschach inkblot, and how it is unique among the panoply of psychometric assessment instruments.

Further Considerations

Post-hoc analyses further examined the nature of the relationship between the factors of Perceptual Accuracy, Holistic Organization, General Response Process, and the demographic variables under examination. Notable findings were observed only with the Rorschach factor variable General Response Process, which demonstrated statistically significant associations with age, estimated premorbid verbal abilities, number of medical diagnoses and medications, and residential status. Holding the first four variables constant, however, attenuated the relationship between residential status and General Response Process (RSP), suggesting that the association between place of dwelling and RSP was mediated by age, health status, and premorbid verbal

abilities, all of which were significantly different in the residential care facility group. Additionally, General Response Process was regressed on age and information processing rate, since both of the latter variables were significantly associated with general Rorschach responding. Results of the regression indicated that age made no significant contribution to RSP once information processing rate was accounted for. The lack of association between Perceptual Accuracy, Holistic Organization, and the demographic variables examined suggests that, in these older adults, these factor variables were not influenced by years of education, current mental status, estimated premorbid verbal intelligence, medical diagnoses, or medication regimen.

Methodological Issues

As indicated throughout the discussion of the results, several factors limit the generalizability of the findings. Though age was a normally distributed variable, recruiting limitations resulted in some decades being over-represented: There were only seven subjects in their sixth decade, 33 in their seventh decade, 29 in their eighth, and 11 in their ninth decade. Thus, an even distribution of age by decade was not obtained, perhaps attenuating potential age effects among predictor and criterion variables. Secondly, the sample was not ethnically diverse; moreover, the majority of community-dwelling adults were recruited from a religious faith advocating a healthy lifestyle. Both the lifestyle aspect, as well as membership in a group offering the companionship and support of others, may make these participants different from other older adults in the general

community. The entire sample was more educated than is observed with current cohorts of the same age; thus, other results may have been obtained with a less educated group. Lastly, difficulties with recruitment meant that subjects with neurologic histories were not excluded, as long as they could independently complete the MMSE and digit symbol tasks; this created a confound, however, as digit symbol performance in these individuals could have been influenced by age, disease process, or (more likely), some combination thereof.

Final Considerations

In this group of older adults, only the factor variable General Response Process varied as a function of age; Perceptual Accuracy and Holistic Organization did not. Thus, at least in terms of perceptual accuracy and holistic integration, persons in their seventies were producing protocols similar to persons 10 to 15 years their senior. Nonetheless, this sample did evidence significant differences in the determinants and scores in question as compared to the relatively young Exner (1990) normative sample. It has been suggested that it is inappropriate to compare small sample research to the normative data base because of the differences in reference group patterns (Dies, 1995). While this may be true, and while clinical interpretation of data does depend to a large degree on how scores relate to each other, normative reference groups do provide a set of expectations which guide interpretation.

The results of the present study indicated that, in older adults, differences in information processing influenced some aspects of Rorschach performance to

some degree. Since older adults are known to be slower information processors than young adults, perhaps this provides a clue to why this sample produced significantly different frequencies of scores and determinants as compared to Exner's normative group. In addition, differences in personality traits, particularly agreeableness and openness, seemed to contribute to variation in Rorschach performance in this group of older persons. The fact remains, however, that a large part of the variance in Rorschach performance was unaccounted for by the variables examined, which included cognitive, personality, and demographic factors.

Why, then, was this group of older adults, like others in the research, significantly different in all measured Rorschach variables as compared to Exner's (1990) normative sample? One possibility is that this particular group of adults would have always responded in that manner. That is, had they been followed longitudinally, no significant changes would have been observed in their protocols from time 1 to time 2. Another is that this is a cohort effect, unique to this particular group of older adults and perhaps a function of a lack of psychological sophistication. Lastly, and perhaps more likely, is that the psychological tasks of older adults differ from younger adults, and it is this difference that is influencing the manner in which older adults respond. Coming to terms with impending death, possible frailty and deteriorating health, the loss of roles, decreased autonomy, the loss of loved ones, and how one has lived life is a responsibility often facing people as they age. For some, considering and resolving these

issues can impact their psychosocial and affective adjustment and the quality of life in their later years. In fact, in Erikson's developmental theory, the last stage of life is characterized by a conflict between integrity and despair, a conflict that results in wisdom if resolved (Erikson, Erikson, & Kivnick, 1986). Thus, it is perhaps this psychological process that is influencing the manner in which older adults respond to the Rorschach.

The latter observation suggests a direction for future research. Assessing the developmental tasks of older adults and how they relate to, or influence, Rorschach response formation, would be helpful in elucidating normative expectations for performance. In this way, patterns of responding arising from developmental issues (if there are any) could be differentiated from responding indicative of distress or other pathological processes. Of course, large scale, longitudinal Rorschach studies with older adults, demographically similar to those in the general population, are sorely needed to elucidate what changes, if any, are to be expected on the task with age. For example, it could be that an investigation with a larger sample size would not replicate the differences in responding observed between Exner's normative data base and the older adults in the present study. Furthermore, perhaps the current results are a function of the cohort studied; it could be that future generations of older adults would respond differently again, due to presumable changes in psychological mindfulness and sophistication. These questions demand longitudinal investigations across the age spectrum, taking into account potentially

moderating demographic variables and cohort differences in psychological development.

In conclusion, the results of this study indicate that the Rorschach can be a useful assessment tool with older adults residing both within the community and care facilities. Several caveats must be kept in mind, however. This investigation suggests that older persons may produce protocols which differ from younger adults partly as a function of differences in cognitive processes, and partly due to differences in the personality trait of openness and perhaps agreeableness. Nonetheless, other as yet unmeasured variables appear to be contributing to the majority of variance in performance. In sum, these factors should be considered when clinically interpreting the Rorschach protocol of an older adult, especially if differences are found between the latter and normative data.

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APPENDIX A

Appendix A

Consent Form

MICHIGAN STATE UNIVERSITY Department of Psychology

RESEARCH CONSENT FORM

Title of Project: Rorschach Responses in Older Adults Differing in Residential
Status: Resource and Trait Theory Perspectives

The following explains your rights as a potential participant in a research project; in signing this paper, you are acknowledging that the experimenter has explained these rights to you and that you have understood them.

1. Your participation in this study is voluntary; you may refuse to participate at any time without penalty, even if you agree to participate now. Furthermore, even if you agree, you may refuse to answer any of the tests or the experimenter's questions. For residents of nursing homes or the Grand Rapids Home for Veterans, withdrawing your participation from the study, or refusing to answer tests or questions, will not affect the care or services you are being provided in any way. As a volunteer, you will receive no money for participating.

2. The study will take approximately three hours; any time you desire a break, tell the experimenter and we will stop for as long as you wish. If you want to stop for the day, tell the experimenter and another appointment will be scheduled at your convenience.

3. Your participation in the study will be kept confidential; only a code number, not your name, will appear on the answer sheets. No one else will know how you responded, or even that you participated, unless you tell them yourself.

4. The results of your individual contribution, the nature of the tests administered, and/or the results of the study will be explained more at a later date, if you so desire.

5. This study is being conducted by Lidia Domitrovic, M.A., under the supervision of Dr. Norman Abeles at the Michigan State University Aging Project. The measures to be administered are common psychological tests; by participating, you are helping psychologists understand how people's answers change as they grow older, what these changes may mean, and what kinds of tests might work best with older adults.

Signed: _____

Date: _____

APPENDIX B

Appendix B

Rorschach Determinants: Exner's (1990) Normative Values for 700 Nonpatient Adults

Determinant/Score	<i>M</i>	<i>SD</i>
<i>R</i>	22.67	4.23
<i>W</i>	8.55	1.94
<i>M</i>	4.30	1.92
<i>Zf</i>	11.81	2.59
<i>P</i>	6.89	1.38
<i>F+%</i>	.71	.17
<i>X+%</i>	.79	.08
<i>X-%</i>	.07	.05

Note. From A Rorschach workbook for the comprehensive system, (3rd ed., pp158-159), by J. E. Exner, 1990, Asheville, NC: Rorschach Workshops.

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