Cognitional Impairment: Is There a Role for Cognitive Assessment in the Treatment of Individuals Civilly Committed Pursuant to the Sexually Violent Predator Act?

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Abstract

Sexually Violent Predator statutes allow the involuntary treatment of individuals who are found to pose a threat to public safety. Most sex offender treatment programs rely on cognitive interventions to reduce the risk of recidivism. The purpose of this study was to examine (a) whether individuals with paraphilia diagnoses have cognitive deficits compared with the general population; (b) whether individuals diagnosed with pedophilia differed on cognitive performance when compared with individuals diagnosed with paraphilia not otherwise specified (NOS), nonconsent; and (c) whether individuals with paraphilia plus antisocial personality disorder (ASPD) differed in cognitive performance when compared with individuals with a paraphilia diagnosis only. The sample consisted of 170 males (*M* age = 50.21; *SD* = 10.22) diagnosed with pedophilia or paraphilia NOS, nonconsent, who were detained or civilly committed to a forensic psychiatric hospital. Assessments included Repeatable Battery for the Assessment of Neuropsychological Status (RBANS), Wechsler Abbreviated Scale of Intelligence (WASI), and Wide Range Achievement Test 4 (WRAT4). Individuals

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diagnosed with pedophilia and paraphilia NOS, nonconsent, obtained lower scores than matched controls based on the RBANS Immediate Memory, Visuospatial/ Constructional, Delayed Memory indices and Total Score. In comparison with individuals with paraphilia NOS, nonconsent, those with pedophilia diagnosis had lower scores on the RBANS Delayed Memory. Individuals diagnosed with a paraphilia disorder combined with ASPD demonstrated trends toward lower IQ scores than those with a paraphilia diagnosis only. Treatment programs can improve their chance of success by assessment of cognitive processes, and offer therapy in a style that is consistent with the cognitive abilities of their clients.

Keywords

sexual offender treatment, pedophilia, paraphilia NOS, cognition, responsivity principle, sexually violent predators

Sexually Violent Predator (SVP) or Sexually Dangerous Person (SDP) statute classifies the civil commitment of a small group of sex offenders found to represent a danger to public safety if released from custody. Since 1990, 20 states and the federal government have enacted such laws (for reviews, see Fitch & Hammen, 2003; Sreenivasan, Frances, & Weinberger, 2010). Civil commitment under the SVP/SDP statute represents indefinite, involuntary psychiatric hospitalization for purposes of confinement and treatment to minimize risk of dangerousness. Central to civil commitment is the presence of a mental disorder affecting emotional or volitional capacity along with evidence of risk for engaging in predatory sexually violent criminal behavior (e.g., Commitment of Sexually Violent Predators, 1994; Sexually Violent Predator (SVP) Act, 1995). Both emotional and volitional capacity can be affected by cognitive processes, an often overlooked aspect of the functioning of those committed under the SVP/SDP statute.

The most commonly used diagnoses for civil commitment of sex offenders are pedophilia and paraphilia not otherwise specified (NOS), nonconsent (Jumper, Babula, & Casbon, 2012; Perillo, Spada, Calkins, & Jeglic, 2014). Research related to cognitive abilities among individuals diagnosed with pedophilia or those who have committed sexual offenses against children is limited. Emerging data demonstrate deficits within the cognitive domains of memory (Cantor et al., 2004), processing speed (Suchy, Whittaker, Strassberg, & Eastvold, 2009), and executive function (Cohen, Nesci, Steinfeld, Haeri, & Galynker, 2010; Schiffer & Vonlaufen, 2011). Moreover, researchers examining intellectual functioning on standardized tests among individuals with pedophilia have generated variable results with some studies showing scores in the average range (e.g., Baldwin & Roys, 1998; Fisher & Howell, 1970), whereas in other studies, intellectual functioning has been shown to be below average (e.g., Blanchard et al., 2007; Joyal, Black, & Dassylva, 2007). These inconsistencies may reflect mixing heterogeneous groups of sex offenders with diverse characteristics and crimes, and comparing them with nonsexual offenders. To the best of our knowledge, no research has yet been conducted on both intellectual and other neurocognitive

domains in reference to repeat rapists diagnosed with paraphilia NOS, nonconsent. In one study, rapists, in comparison with convicted felons, showed lower intellectual functioning (Ruff, Templer, & Ayers, 1976), and in another study, rapists in comparison with individuals with pedophilia demonstrated higher intellectual functioning (Joyal et al., 2007). The small sample size in these studies limits the generalizability of the findings.

Cognitive deficits are a major feature of many mental disorders and may be of relevance in determining volitional impairment, one defining feature of a diagnosed mental disorder under the SVP/SDP Act. Generically defined, volition or act of will refers to the conscious choice or intention of an individual to commit a particular action. Cognitive processes such as attention, memory, language, and executive functions are fundamental for goal-directed behaviors and optimal adaptation in everyday life. Hence, deficits in acquisition and consolidation of contextual information can interfere with adaption and impair volitional control. Cognitive deficits in the presence of paraphilia or personality disorders might be useful in the distinction of mental disorders that affect volitional control. Furthermore, general cognitive functioning such as attention, information processing, aspects of memory, and higher order cognitive functions may be associated with treatment outcome and recidivism rates.

The exact etiology of pedophilia is unknown, but a growing body of evidence suggests that neurodevelopmental and social learning disturbances might contribute to sexual attraction toward children. Pedophilic offenders targeting children exhibit higher rates of left handedness (Bogaert, 2001; Cantor et al., 2004), school grade failure (Cantor et al., 2006), organic temporal disturbances (Mendez, Chow, Ringman, Twitchell, & Hinkin, 2000), acquired frontal neuropathology (Burns & Swerdlow, 2003), and sustained head trauma resulting in a loss of consciousness (Blanchard et al., 2002; Blanchard et al., 2003). Neuroanatomical anomalies such as reduced gray matter volume in limbic (Schiltz et al., 2007) and frontostriatal regions (Schiffer et al., 2007), as well as white matter reduction in temporal and parietal lobes bilaterally (Cantor et al., 2008), have been found within samples of pedophilic offenders. Poeppl et al. (2013) compared brain imaging data of sexual offenders with nonsexual offenders to control for general criminality and chronic stress related to prolonged incarceration. The results revealed reduced gray matter volume in the right amygdala, insula, dorsal lateral prefrontal cortex, angular gyri, and orbitofrontal cortex of sexual offenders. Pedophilic offenders also show neural activation in the reward circuit when they view images of children. In comparison with controls, pedophilic offenders, when exposed to erotic images with pedophilic content, demonstrated activation within the limbic system (Schiffer et al., 2008). In another study, images of boys in swimsuits activated the amygdala (Sartorius et al., 2008). These brain regions are critical for the regulation of sexual arousal (Arnow et al., 2002; Redouté et al., 2000) and are likely to be involved in the pathogenesis of sexual deviance.

Cognitive weaknesses may restrict the ability to learn new skills and represent vulnerability to recidivism on release. Given that most sex offender treatment programs have high cognitive demands (e.g., writing an autobiography, identifying patterns and pathways of offending), it would be imperative to assess information-processing abilities and offer ancillary interventions to individuals with compromised cognitive

functioning. The present study supplements previous findings by focusing on sex offenders with a diagnosed paraphilia that are detained or civilly committed under the SVP law, and examining a broad range of intellectual and other neuropsychological domains. The research questions were as follows:

> **Research Question 1:** Do cognitive functions in sexual offenders with a diagnosed mental disorder who are detained or civilly committed differ from the general population?
>
> **Research Question 2:** Are there cognitive differences between those diagnosed with pedophilia in comparison with those diagnosed with paraphilia NOS, nonconsent?
>
> **Research Question 3:** Does the presence of antisocial personality disorder (ASPD) combined with a paraphilia diagnosis lead to greater cognitive impairments?

Method

Participants

The study utilized a 6-year (2005 to 2011) retrospective review of the clinical records of individuals that were detained or civilly committed to a state forensic psychiatric hospital pursuant to the California SVP Act, and who had agreed to participate in a routine cognitive assessment for treatment purposes. Cognitive assessment was conducted after obtaining informed written consent acknowledging participation free of threat and the right to withdraw at any time. The retrospective data analysis was approved by the local Hospital Research Committee and California Protection of Human Subjects. The exclusion criteria for data analysis included history or presence of psychotic disorders, learning disabilities, mental retardation or pervasive developmental disorders, and head trauma with loss of consciousness >5 min. Participants' Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) data were excluded if their effort index (internal validity indicator) was greater than 3 points, suggesting insufficient effort during testing (Silverberg, Wertheimer, & Fichtenberg, 2007). Fourteen percent of the participants were excluded from the study due to insufficient test-taking effort. The final sample consisted of two groups: 114 individuals with pedophilia and 56 individuals with paraphilia not otherwise specified (NOS), nonconsent, diagnoses. Age-, education-, and ethnicity-matched controls ($n =$ 99) were drawn from the RBANS normative standardization sample. Individuals were diagnosed using the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association [APA], 2000) criteria; therefore, *DSM-IV-TR*, rather than the latest edition of *DSM* nomenclature is used throughout this article.

Diagnostic and Cognitive Measures

All diagnoses and test scores were obtained from patient treatment records. Diagnoses were made according to *DSM-IV-TR* criteria by at least two forensic evaluators and

consensus from a multidisciplinary treatment team. RBANS (Randolph, 1998), Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999), and Wide Range Achievement Test 4 (WRAT4; Wilkinson & Robertson, 2006) were administered by a psychologist or master's level mental health professional as a part of routine cognitive assessment to determine clinical needs. The RBANS is a brief cognitive assessment tool that consists of 12 subtests, which yield five index scores and a total score. Test indices are Immediate Memory (comprising List Learning and Story Memory tasks), Visuospatial/Constructional (comprising Figure Copy and Line Orientation tasks), Language (comprising Picture Naming and Semantic Fluency tasks), Attention (comprising Digit Span and Coding tasks), and Delayed Memory (comprising List Recall, Story Recall, Figure Recall, and List Recognition tasks). The RBANS also yields a global cognitive function Total Score (comprising the five index scores). The *WASI* is an abbreviated IQ assessment consisting of four subtests: Vocabulary, Similarities, Block Design, and Matrix Reasoning. It estimates the three traditional Verbal, Performance, and Full Scale IQ scores. The WRAT4 measures basic academic skills and consists of four subtests: Sentence Comprehension, Word Reading, Spelling, and Math Computation. The Math Computation subtest was administered only to a small number of participants and was excluded for further analysis.

Data Analysis

The primary scores for each of the tests were initially examined for normality of distribution and homogeneity of variance. Distributions that were notably skewed were transformed using logarithmic transformation. Statistical analyses were organized into four main sections. First, demographic variables for individuals diagnosed with pedophilia versus paraphilia NOS, nonconsent, were compared using *t* tests and chi-square tests. Second, MANOVAs were used to examine performance differences, with diagnosis as between and test scores as within factors, with follow-up independent *t* tests on the individual domains. Third, performance of the current sample on the RBANS battery was compared with matched controls drawn from the standardization sample. Fourth, Fisher's Least Significant Difference (LSD) tests were used to perform post hoc pairwise between-group comparisons. Cohen's *d* values were computed to estimate effect size. The *p* value for all analyses was set at .05. Statistical analyses were carried out using SPSS 16.0 for Windows 2000 (SPSS, Chicago, IL, USA).

Results

Examination of the score distributions revealed that the WASI Verbal and the RBANS Digit Coding subtest were notably skewed. Logarithmic transformations were performed on these scores. The age range was from 26 years to 82 years (M = 50.21; SD = 10.22) with no significant difference between individuals diagnosed with pedophilia in comparison with those with paraphilia NOS, nonconsent, $t(168) = 0.56$, $p = .57$. On average, individuals had 10 to 12 years of education (or equivalent) with no

Table 1. Demographic and Clinical Characteristics of Individuals Diagnosed With Pedophilia in Comparison With Those With Paraphilia NOS, Nonconsent.

	Pedophilia (n = 114)	Paraphilia NOS (n = 56)
M age (SD)	50.66 (10.69)	49.84 (7.88)
Education (%)		
Less than eighth grade	0	3.6
Some high school	26.5	21.8
GED	20.4	23.6
High school diploma	23.0	23.6
Some college	23.9	25.5
College graduate	5.3	1.8
Graduate degree	.9	0
Ethnicity (%)		
African American	9.6	41.8
Caucasian	66.7	40.0
Hispanic	14.0	14.5
Other	9.6	3.6
Comorbid disorders (%)		
Antisocial personality disorder	22.4	43. 6
Substance use disorders	61.5	63.2

Note. NOS = not otherwise specified; GED = general education development.

differences across diagnoses, $\chi^2(6, N = 168) = 6.24$, $p = .34$. The paraphilia NOS, nonconsent, group had a greater proportion of African Americans relative the pedophilia group, $\chi^2(3, N = 170) = 25.38$, $p < .001$. Furthermore, individuals with a paraphilia NOS, nonconsent, diagnosis had a significantly higher proportion of ASPD comorbidities than those with a pedophilia diagnosis, $\chi^2(1, N = 170) = 8.02$, $p < .05$. Table 1 shows the clinical and demographic characteristics of the sample comparing pedophilia and paraphilia NOS, nonconsent, diagnoses.

The overall MANOVA showed no group differences on the RBANS battery, Wilks's $\lambda(6, 162) = .94$, $p = .13$; WASI, Wilks's $\lambda(3, 162) = .98$, $p = .43$; and WRAT4, Wilks's $\lambda(4, 73) = .99$, $p = .96$. Independent-samples t tests revealed that individuals diagnosed with pedophilia had significantly lower scores on the RBANS Delayed Memory index than those diagnosed with paraphilia NOS, nonconsent, $t(168) = 2.68$, $p = .01$. There were no other significant differences between the two diagnostic groups. Table 2 shows the mean and standard deviation for each of the test scores by group. No group differences were observed on the 12 individual subtests of RBANS, Wilks's $\lambda(12, 154) = .91$, $p = .27$, or on the 4 WASI subscales, Wilks's $\lambda(4, 156) = .98$, $p = .47$.

Matched Controls

For this analysis, the paraphilia diagnoses sample was matched, on average, to age, ethnicity, and education with controls drawn from the RBANS standardization

Table 2. Mean (Standard Deviation) of Test Scores for RBANS, WASI, and WRAT4 for Individuals Diagnosed With Pedophilia in Comparison With Those With Paraphilia NOS, Nonconsent.

	Pedophilia		Paraphilia NOS		
	M (SD)	Range	M (SD)	Range	p value
RBANS					
Immediate memory	82 (20)	40-129	85 (20)	44-132	.32
Visuospatial/constructional	91(17)	56-126	90 (20)	60-126	.79
Attention	92 (11)	47-120	94 (12)	57-132	.20
Language	89 (21)	40-132	91 (16)	46-135	.67
Delayed memory	87 (17)	44-122	94 (15)	56-117	.01*
Total score	85 (15)	51-129	88 (15)	66-117	.21
WASI					
Verbal IQ	99 (18)	60-142	99 (15)	63-129	.98
Performance IQ	102 (14)	70-149	100 (15)	69-137	.31
Full IQ	101 (16)	66-148	99 (16)	61-138	.46
WRAT4					
Sentence comprehension	93 (16)	55-145	93 (13)	70-130	.75
Word reading	92 (13)	55-125	93 (13)	73-125	.84
Spelling	93 (18)	55-145	93 (14)	69-135	.61
Reading composition	91 (14)	55-129	92 (13)	74-126	.67

Note. RBANS = Repeatable Battery for the Assessment of Neuropsychological Status; WASI = Wechsler Abbreviated Scale of Intelligence; WRAT4 = Wide Range Achievement Test 4; NOS = not otherwise specified.
*Statistically Significant ($p < .05$)

sample. The control sample was smaller ($n = 99$) and slightly older in age ($M = 53.1$; $SD = 17.97$) than the current sample. Figure 1 shows the mean performance for the control and paraphilia groups on the RBANS. The overall MANOVA was statistically significant, Wilks's $\lambda(12, 512) = .79$, $p < .001$, indicating RBANS scores were different among the three groups. Pairwise comparisons using Fisher's LSD demonstrated that matched controls scored higher than individuals diagnosed with pedophilia and paraphilia NOS, nonconsent, on Immediate Memory, Visuospatial/Construction, and Total Score. Matched controls also outperformed individuals diagnosed with pedophilia but not paraphilia NOS, nonconsent, on Attention, Language, and Delayed Memory. Table 3 shows the pairwise post hoc comparisons using Fisher's LSD. The group differences yielded effect sizes in the moderate ($d = .49$) to large range ($d = .99$). The largest effect sizes were found for matched control versus pedophilia in Immediate Memory ($d = .99$) and Total Score ($d = .97$). The only comparison that reached statistical significance between pedophilia and paraphilia NOS, nonconsent, was on Delayed Memory ($d = .45$).
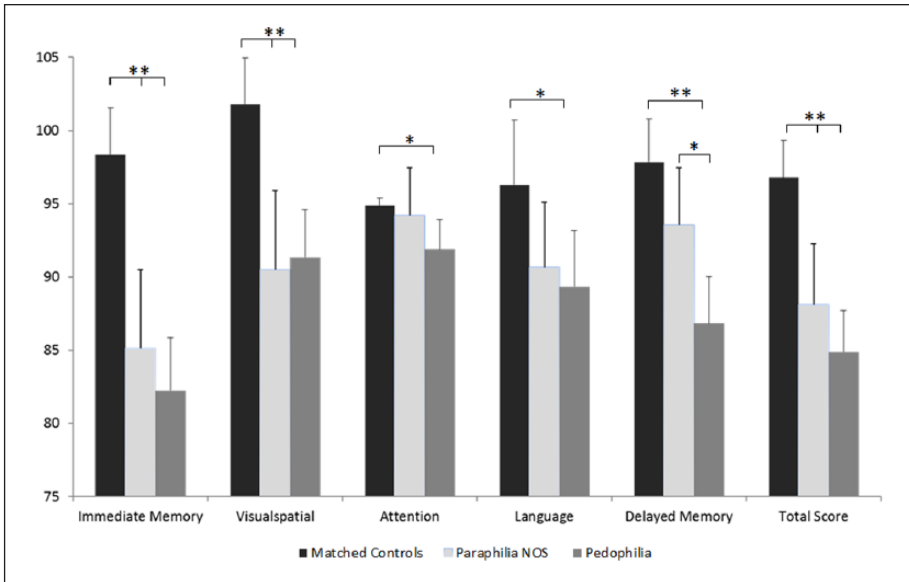
Figure 1. RBANS index mean scores for pedophilia, paraphilia NOS, nonconsent, and matched control samples.
Note. Bars indicate 95% confidence intervals of mean scores. RBANS = Repeatable Battery for the Assessment of Neuropsychological Status; NOS = not otherwise specified.
*$p < .05$. ** $p < .01$.

RBANS Subtest Scores

Compared with matched controls, individuals with pedophilia and paraphilia NOS, nonconsent, diagnoses scored lower on several of the RBANS subtests, Wilks's $\lambda(24, 496) = .63$, $p < .001$. Table 4 shows the mean raw scores and standard deviations along with pairwise Fisher's LSD comparisons of the three groups.

ASPD

The present sample was not large enough to examine the comorbid effects of other diagnoses associated with paraphilias. Therefore, pedophilia and paraphilia NOS, nonconsent, diagnoses were combined to compare the performance of individuals diagnosed with a paraphilia plus ASPD ($n = 49$) with those with a paraphilia diagnosis only ($n = 121$). There were no significant differences between the groups with respect to age, $t(168) = 0.76$, $p = .45$, and years of education, $\chi^2(6, N = 168) = 5.79$, $p = .45$. In general, individuals with paraphilia plus ASPD obtained lower scores on all measures when compared with those with a paraphilia diagnosis only. Trends toward statistical significance were evident, but the overall MANOVA was not significant: RBANS, Wilks's $\lambda(6, 162) = .94$, $p = .13$, WASI, Wilks's $\lambda(3, 162) = .96$, $p = .07$, and WRAT4, Wilks's $\lambda(4, 73) = .92$, $p = .19$.

Table 3. Pairwise Fisher's LSD Comparisons of the Three Groups on the RBANS Index Scores.

	Immediate memory	Visuospatial/ constructional	Attention	Language	Delayed memory	Total score
Paraphilia NOS vs. pedophilia						
Effect size	—	—	—	—	.45	—
p value	.29	.77	.64	.18	.008	.17
Control vs. pedophilia						
Effect size	.91	.63	.31	.42	.69	.85
p value	.001	.001	.02	.003	.001	.001
Control vs. paraphilia NOS						
Effect size	.74	.62	—	—	—	.61
p value	.001	.001	.16	.25	.10	.001

Note. RBANS = Repeatable Battery for the Assessment of Neuropsychological Status; LSD = least significant difference; NOS = not otherwise specified.

Discussion

The RBANS battery was used to detect cognitive differences between individuals with a paraphilia diagnosis when compared with matched controls. Individuals with pedophilia and paraphilia NOS, nonconsent, diagnoses demonstrated low average performance across a range of cognitive domains, notably immediate and delayed memory. Contrary to previous findings, performance on intelligence (WASI) and academic achievement (WRAT4) was not different relative to the general population. The present findings suggest that below average cognitive functioning constitutes an important cognitive feature of sexual offenders who are detained or civilly committed. The etiology of the these impairments is unknown, and they may predate the onset of sexual offending, or occur later, as a result of substance use, incarceration, or other risk factors that are associated with sexual offending. A thorough understanding of a sexual offender's information-processing abilities can strengthen treatment responsivity and ultimately reduce the likelihood of engaging in future sexual crimes.

In many treatment programs, addressing offense-supportive thinking is the *sine qua non* treatment of sexual offenders (Beech, Bartels, & Dixon, 2013). Historically, these approaches have been referred to as confronting cognitive distortions (e.g., Abel, Becker, & Cunningham-Rathner, 1984). Perception, attention, organization, retrieval, and storage are the prerequisite of conscious thought and interpretation of incoming stimuli. In sexual offenders with extremely low cognitive scores, the so-called cognitive distortions may not necessarily be deliberate justifications of deviant behaviors but may represent compromised cognitive operations. Similarly, encoding, storing, and retrieval failures might erroneously be attributed to denial or minimization. In these offenders, understanding the impact of information-processing impairments as such, and not as deliberate denial of responsibility or minimizing the extent of abuse, can lead to alternative and supportive methods of getting offenders to take responsibility for their behaviors.

Table 4. Mean Raw Scores (Standard Deviations) of Each of 12 RBANS Subtests Along With Pairwise Fisher's LSD Comparisons of the Three Groups.

	Matched controls	Paraphilia NOS	Pedophilia
Immediate memory			
List learning (0-40)	27.57 (5.4)[a]	24.41 (5.0)[b]	22.99 (5.7)[b]
Story memory (0-20)	17.63 (4.0)[a]	14.27 (5.4)[b]	14.04 (5.1)[b]
Visuospatial/constructional			
Figure copy (0-20)	18.49 (1.8)[a]	15.69 (3.5)[b]	15.59 (3.6)[b]
Line orientation (0-20)	16.74 (2.0)	16.82 (3.2)	17.34 (2.8)
Language			
Picture naming (0-10)	9.64 (.9)	9.55 (1.4)	9.7 (.6)
Semantic fluency (0 <)	19.40 (4.2)[a]	18.65 (3.7)[a,b]	17.73 (4.4)[b]
Attention			
Digit span (0-16)	10.43 (2.3)	9.8 (2.6)	9.89 (3)
Coding (0-89)	44.89 (11.3)[a]	43.35 (10.9)[a,b]	41.66 (11.1)[b]
Delayed memory			
List recall (0-10)	5.91 (2.6)[a]	4.9 (2.5)[b]	5.0 (2.7)[b]
List recognition (0-20)	19.24 (1.4)[a]	19.13 (1.1)[a,b]	18.79 (1.4)[b]
Story recall (0-12)	9.06 (2.4)[a]	7.6 (3.2)[b]	7.0 (3.3)[b]
Figure recall (0-20)	13.89 (4.5)[a]	12.52 (4.25)[a,b]	11.69 (4.4)[b]

Note. Means in the same row that do not share the same superscript letter are significantly different, $p < .05$. RBANS = Repeatable Battery for the Assessment of Neuropsychological Status; LSD = least significant difference; NOS = not otherwise specified.

Psychotherapy groups can also maximize treatment gains by incorporating interventions that match individuals' cognitive strengths and weaknesses. Programs with a strong emphasis on cognitive conceptualization of sexual offending might rely heavily on assignments with excessive cognitive demands such as writing an autobiography, completing offense progression chain assignments, and journaling exercises. The cognitive functions needed to execute these assignments may exceed the skills set of those with cognitive deficits and represent an obstacle toward completing the treatment program. Behavioral strategies rather than cognitive-laden assignments to reduce risk factors for sexual recidivism may be more effective for those with cognitive impairments. Moreover, cognitive limitations can negatively affect treatment motivation and lead to dropout. Aligning the overall residential milieu to support the transfer of skills from group sessions to the living environment warrants particular attention. Cognitive weaknesses may partially be responsible for poor integration of gains within the treatment group setting to other environments. Finally, effective programs should also address the responsivity of individuals with advanced cognitive abilities. This may include psychosocial groups where sexual offending is processed in cultural and biological context.

A corollary issue is how cognitive processes affect self-regulation of everyday behavior. Self-regulation encompasses the ability to make plans, choose from alternatives, override habitual responses, inhibit unwanted thought, and make corrective

adjustments (Carver & Scheier, 2012; Heatherton & Baumeister, 1996). In recent years, the self-regulation model of sexual offending has gained considerable support and has expanded relapse prevention to address the diversity of pathways to offending (Ward & Hudson, 1998). Another finding of this study was that the co-occurrence of ASPD plus paraphilia was linked with lower IQ scores. Deviant sexual preferences and antisocial orientation are considered two of the major predictors of sexual recidivism (Hanson & Bussière, 1998). How well people self-regulate and pursue long-term goals involves, in part, how they process incoming information, store and maintain knowledge, choose alternative options, and remember past decisions (Hofmann, Friese, Schmeichel, & Baddeley, 2011). In individuals with compromised cognitive processes, exerting control over oneself to bring desired results might be even more difficult, leading to self-regulation problems.

In general, memory scores for sexual offenders were lower in comparison with scores from matched controls. These findings are consistent with Cantor et al. (2004), where sexual interest in prepubescent children was associated with lower immediate/delayed verbal and visuospatial free recall memory. In the present study, aside from the overall memory differences, individuals with a pedophilia diagnosis showed lower memory scores in comparison with those with a paraphilia NOS, nonconsent, diagnosis. One possible explanation of this finding might be the chronic stress and the low social hierarchy experience of child molesters in prison. Incarcerated child molesters either experience or are under the threat of assault by other inmates and placed under protective custody. Chronic stress is known to produce hyperactivity in the hypothalamic–pituitary–adrenal (HPA) system and disrupt memory and other cognitive functions (Jones & Moller, 2011; Wingenfeld & Wolf, 2011). We acknowledge that attributing the memory deficits to the incarceration experience is speculative and requires prospective testing. In fact, these differences arguably may predate offending and incarceration altogether. Although we cannot pinpoint the origin of these cognitive differences, our findings may represent an etiological element in repetitive offending despite adverse consequences. Individuals with cognitive deficits might have limited resources to self-regulate and may be more likely to make careless or impulsive decision in situations that require cognitive demands.

There are several limitations to our study. First, there was no assessment of symptom amplification/malingering. We attempted to address motivation through excluding individuals with suboptimal effort based on the embedded RBANS Effort Index. The RBANS Effort Index was developed to differentiate patients who demonstrate good effort from those with poor effort. The index has shown acceptable discrimination between actual cases of traumatic brain injury and malingering groups (Silverberg et al., 2007). Nonetheless, a stand-alone effort index such as the Test of Memory Malingering (Tombaugh, 1996), or the Word Memory Test (Green, 2005), is recommended for further research. A second limitation is the lack of a comprehensive assessment of executive functioning. We considered looking at the recently developed Executive Functioning measure from the RBANS (Kaminetskaya, Melville, & Poole, 2013), but believed at this time that the research was preliminary and not necessarily associated with our population of interest. Furthermore, we considered the WASI subtest similarities as a proxy for executive functioning, but did not believe this subtest

could capture the domain sufficiently. Future research utilizing executive functioning measures such as the Stroop (Golden, 1978), Iowa Gambling Test (Bechara, 2007), and Wisconsin Card Sorting Test (Heaton, 1981) is recommended. A third limitation is the restriction of the sample to sex offenders detained or committed California SVP Act. According to State of California Department of Justice, Megan's Law Homepage (2015), there are approximately 82,781 registered sex offenders in California. The present sample constitutes a small class of sexual offenders, and generalizability to outpatient sex offenders is limited. A fourth limitation is the retrospective data analysis. Retrospective studies have several methodological limitations such as selection bias, variability in test administration, and data collection that extends over several years. A fifth and critical limitation is that there was no nonsexual hospitalized comparison (control) group. The present findings might reflect cognitive weaknesses that are evident in hospitalized offenders with or without sexual crimes. Future research comparing the cognitive performance of sexual and nonsexual offenders may provide more information on differences that are specific to sexual offenders. In addition, as articulated by Cantor (Cantor et al., 2004, Cantor et al., 2006), the cognitive deficits might be features of offenders who are apprehended—not those in the general community. Finally, an abbreviated IQ measure was utilized; therefore, we cannot determine definitively whether individuals detained or committed under the CA SVP act have mean IQs in the average range. It is possible that, compared with comprehensive measures of intelligence, abbreviated measures of intelligence have limited use and lack sensitivity in pinpointing intelligence deficits.

The findings presented in this article suggest a number of directions for future research, mainly ideas for a thorough assessment of cognitive processes and strengthening the responsivity principle. Cognitive weaknesses can restrict the ability to learn new skills and represent vulnerability markers for recidivism. Assessment of cognitive functions in sexual offenders may have important implications in developing effective treatment plans, rehabilitation, and potentially, risk assessment and recidivism prediction.

Authors' Notes

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