

- Nowicki, S., & Duke, M. P. (1982). A review of the Nowicki-Strickland locus of control scales. In H. Lefcourt (Ed.), *Research with the locus of control construct: Vol. 2. Methods and application* (pp. 9-39). San Diego, CA: Academic Press.
- O'Brien, M. D., & Webster, S. D. (2007). The construction and preliminary validation of the Internet Behaviors and Attitudes Questionnaire (IBAQ). *Sexual Abuse: A Journal of Research and Treatment, 19*, 237-256.
- Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barratt Impulsiveness Scale. *Journal of Clinical Psychology, 51*, 768-774.
- Paulhus, D. L. (1998). *Manual for the Balanced Inventory of Desirable Responding: Version 7*. Buffalo, NY: Multi-Health Systems.
- Quayle, E., & Taylor, M. (2002). Child pornography and the Internet: Perpetuating a cycle of abuse. *Deviant Behavior, 23*, 331-361.
- Quayle, E., & Taylor, M. (2003). Model of problematic Internet use in people with a sexual interest in children. *CyberPsychology and Behavior, 6*, 93-106.
- Quayle, E., Vaughan, M., & Taylor, M. (2006). Sex offenders, Internet child abuse images and emotional avoidance: The importance of values. *Aggression and Violent Behavior, 11*, 1-11.
- Russell, D., Peplau, L. A., & Cutrona, C. A. (1980). The revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology, 39*, 472-480.
- Salter, A. (1988). *Treating child sex offenders and their victims: A practical guide*. London: Sage.
- Saunders, D. G. (1991). Procedures for adjusting self-reports of violence for social desirability bias. *Journal of Interpersonal Violence, 6*, 336-344.
- Seto, M. C., Cantor, J. M., & Blanchard, R. (2006). Child pornography offenses are a valid diagnostic indicator of pedophilia. *Journal of Abnormal Psychology, 115*, 610-615.
- Taylor, M., & Quayle, E. (2003). *Child pornography: An Internet crime*. Hove, UK: Brunner-Routledge.
- Taylor, M., & Quayle, E. (2006). The Internet and abuse images of children: Search, pre-criminal situations and opportunity. In R. Wortley & S. Smallbone (Eds.), *Situational prevention of child sexual abuse* (pp. 169-195). New York: Criminal Justice Press.
- Thornton, D. (1989). *Self-Esteem Scale*. Unpublished manuscript. (Available from David Thornton, P.O. Box 700, Sand Ridge Secure Treatment Center, 1111 North Road, Mauston, Wisconsin 53948)
- Thornton, D. (2002). Constructing and testing a framework for dynamic risk assessment. *Sexual Abuse: A Journal of Research and Treatment, 14*, 139-154.
- Ward, T., & Keenan, T. (1999). Child molester's implicit theories. *Journal of Interpersonal Violence, 14*, 821-838.
- Ward, T., Polaschek, D. L. L., & Beech, A. R. (2006). *Theories of sexual offending*. Chichester, UK: Wiley.
- Ward, T., & Siegert, R. J. (2002). Toward a comprehensive theory of child sexual abuse: A theory knitting perspective. *Psychology, Crime, and Law, 8*, 319-351.
- Ward, T., & Sorbello, L. (2003). Explaining child sexual abuse: Integration and elaboration. In T. Ward, D. R. Laws, & S. M. Hudson (Eds.), *Sexual deviance: Issues and controversies in sexual deviance* (pp. 3-20). London: Sage.
- Webster, S. D., Mann, R. E., Thornton, D., & Wakeling, H. C. (2006). Further validation of the short Self-Esteem Scale with sex offenders. *Legal and Criminological Psychology, 12*, 207-216.
- Wortley, R., & Smallbone, S. (2006). Applying situational principles to sexual offenses against children. In R. Wortley & S. Smallbone (Eds.), *Situational prevention of child sexual abuse* (pp. 7-36). New York: Criminal Justice Press.

## Facial and Prosodic Affect Recognition Among Pedophilic and Nonpedophilic Criminal Child Molesters

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The present study compared facial and prosodic affect recognition abilities among pedophilic and nonpedophilic child molesters and community-dwelling controls. Pedophilic child molesters are characterized by primary sexual interest in prepubescent children, whereas nonpedophilic child molesters are characterized by offending against children despite being primarily sexually attracted to adults. The results showed that nonpedophilic child molesters made more errors in recognizing both facial and prosodic affect, performing more poorly than both controls and pedophilic child molesters. These findings are consistent with greater psychopathic tendencies among nonpedophilic molesters as well as with prior findings of smaller amygdala volume among child molesters.

**Keywords:** facial affect; prosody; affective processing; amygdala; temporal lobe; limbic; child molestation; pedophilia; criminal offending; sexual abuse

With recent advances in cognitive and affective neuroscience, there has been a considerable increase in research examining neuroanatomic, neurocognitive, and neuroaffective underpinnings of criminal offending. The long-term goal of such research is to help identify better treatment and risk assessment approaches for these difficult and often intractable populations. This line of research has identified certain commonalities among criminal offenders. Most notable among these are structural/injury-related (Brower & Price, 2001; Miller, 1999) and metabolic (Ankarsater, 2006; Birdauner et al., 2005; Maller et al., 2003; Wright, Nobrega, Langevin, & Wortzman, 1990) abnormalities in the frontal lobes, as well as problems in reasoning, problems solving, impulse inhibition, empathy, and perspective taking

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(Bergeron & Valliant, 2001; Birbaumer et al., 2005; Dolan, Deakin, Roberts, & Anderson, 2002; Gontkovsky & Morgan, 2005; Lapierre, Braun, & Hodgins, 1995; Stone & Thompson, 2001), all of which are also known to be associated with frontal-lobe dysfunction (Lezak, Howieson, & Loring, 2004).

In addition to demonstrating structural and functional brain abnormalities among criminal offenders on the whole, research has also shown that various types of offenders may be characterized by unique profiles of discrete cognitive or affective problems. For example, differences in discrete aspects of emotional/physiologic, as well as cognitive, processes have been shown between offenders who are psychopathic versus those who are not (Arnett, Howland, Smith, & Newman, 1993; Habel, Kuehn, Salloun, Devos, & Schneider, 2002; Kiehl et al., 2001; Kosson, Suchy, Mayer, & Libby, 2002; Maller et al., 2003; Newman, Patterson, Howland, & Nichols, 1990; Suchy & Kosson, 2005); between criminals who commit violent versus nonviolent crimes (Aigner et al., 2000; Eriksson & Lidberg, 1997); between offenders who suffered abuse as children versus those who did not (Raine et al., 2001); between affective versus predatory murderers (Raine et al., 1998); between criminals who offend sexually versus those who commit nonsexual, nonviolent crimes (Wright et al., 1990); and sex offenders who assaulted an adult versus those who abused a child (Joyal, Black, & Dassylva, 2007). These findings make it clear that criminal offenders are a heterogeneous group and that research hoping to identify meaningful brain abnormalities must focus on discrete types of affective or cognitive dysfunction among discrete groups of offenders. The present study focuses on facial and prosodic affect processing among two discrete types of child molesters.

### Child Molestation

Although exact figures for the prevalence of child sexual abuse are notoriously difficult to establish (Goldman & Padayachi, 2000), by some estimates (Gorey & Leslie, 1997), between 100,000 and 200,000 children are sexually molested each year in the United States alone. Such high prevalence rates have, particularly in the past decade, helped fuel increased research and clinical efforts to understand and treat those (primarily men) who sexually offend against children.

Consistent with the neuropsychological findings on criminal offending in general, some studies have suggested that child molesters as a group are characterized by abnormalities in frontal-lobe structure (Schiffer et al., 2007) and function (Flor-Henry, Lang, Koles, & Frenzel, 1991), or in the connections between the frontal lobes and other brain areas (Cantor et al., 2008). In addition, some studies have found abnormalities in the functioning (Huckler, Langevin, Wortzman, & Bain, 1986; Kawashima et al., 1999) and structure (Cantor et al., 2008) of the temporal-limbic brain areas, most notably the hippocampus (Mendez, Chow, Ringman, Twitchell, & Hinkin, 2000) and the amygdala (Schultz et al., 2007). These areas are highly complex and subserve many functions but are primarily known for their role in memory

and affective processing (Lezak et al., 2004). However, when damaged or diseased, temporal-limbic structures have also been linked to hypersexuality (Baird, Wilson, Bladin, Saling, & Reutens, 2002; Kluver & Bucy, 1939; Ozmen, Erdogan, Duvençi, Ozyurt, & Ozkara, 2004), a finding that may at first blush appear to be most relevant for this population.

However, it has been suggested (Blanchard, Cantor, & Robichaud, 2006) that previously identified cognitive deficits among child molesters reflect a global impairment in cognition rather than a specific neurocognitive profile. In addition, as outlined in the excellent review by Blanchard and colleagues (2006), many studies do not find brain or cognitive abnormalities among child molesters. These inconsistencies in findings are likely at least partly due to considerable heterogeneity of most studied samples. In particular, there are inconsistencies among studies with respect to the control group used, such that some studies compare child molesters to other offenders (Huckler et al., 1986), whereas others compare them to nonoffending controls (Langevin, Wortzman, Wright, & Handy, 1989). Even more important, researchers (in their sampling) have often failed to distinguish between two distinct types of child molesters (Cohen & Galynker, 2002; Quay, Proulx, Cusson, & Quimet, 1921; Seto, 2008): (a) pedophiles (i.e., those for whom prepubescent children are the primary target of sexual interest) and (b) nonpedophiles (i.e., those who offend against young children even though they are primarily sexually interested in adults).

*Pedophilic child molesters.* In addition to the obvious motivational differences between pedophilic and nonpedophilic child molesters (Barsetti, Earls, Lalumiere, & Belanger, 1998; Strand, 1995), pedophiles tend to have more victims (sometimes hundreds; e.g., Abel & Osborn, 1992) and higher rates of recidivism than nonpedophilic child molesters. It has been hypothesized that pedophilic child molesters repeatedly offend against children in part because of poor impulse control mediated by weaknesses in frontal-lobe functions (Flor-Henry et al., 1991; Stone & Thompson, 2001) and more importantly, because of strong sexual attraction toward children presumably mediated by temporal-limbic abnormalities (Bogaert, 2001; Cohen et al., 2002; Cohen & Galynker, 2002; Pallone & Voelbel, 1998; Wright et al., 1990). However, the latter of these mechanisms does not appear applicable to nonpedophilic child molesters.

*Nonpedophilic child molesters.* The reasons for sexual abuse of children by individuals who are sexually attracted to adults continue to be poorly understood. There is limited theorizing, and even less empirical research, regarding the nonsexual motives (e.g., need for control, power, and respect or a desire to eliminate negative emotional states) potentially underlying nonpedophilic child molestation (Mann & Hollin, 2007). Regardless, it is unlikely that any one of such motives would be sufficient in and of itself to lead to a sexual assault against a child. Other contributing factors likely need to be identified.

One such contributing factor is implicated by the type of brain abnormalities identified among these offenders. In particular, although at least one study identified temporal-limbic (particularly amygdala) abnormalities among child molesters as a group (Schlitz et al., 2007), such abnormalities clearly do not lead to abnormal sexual preference for children among the subgroup of nonpedophilic offenders participating in such research (i.e., by definition, this group does not exhibit sexual preference for children). The question then arises, are there any other processes that may be disrupted by abnormal limbic structures that could contribute to sexual child abuse among nonpedophilic molesters. Deficits in affect recognition (AR), known to be mediated in large part by the amygdala (Adolphs, Russell, & Tranel, 1999; Adolphs, Tranel, et al., 1999), could represent one such contributing factor.

### Affect Recognition

Affect recognition refers to the ability to detect affective cues in others. Such cues can be visual (i.e., facial affect, gestures, posture) or auditory (i.e., prosody). The ability to detect such cues in otherwise neutral statements is essential for normal communication as well as for normal interpersonal and social functioning (Dolan & Fullam, 2006; Korringa et al., 2001; McClure, Pope, Hoberman, Pine, & Leibenluft, 2003; Monnot, Nixon, Lovullo, & Ross, 2001; Simmonian, Beidel, Turner, Berkes, & Long, 2001).

It has been argued that the inability to recognize emotional reactions in others may also preclude normal empathy (Parsons, 1980; Shamary-Tsoory, Tomer, Berger, & Aharon-Perez, 2003), resulting not only in problems in social interactions but also potentially leading to antisocial, criminal, or interpersonally cruel behaviors (Carr & Lujtmeier, 2005). Consistent with this notion, it is becoming increasingly recognized that deficits in AR are present in some criminal populations (Carr & Lujtmeier, 2005; Dolan & Fullam, 2006; Kosson et al., 2002; McCown, Johnson, & Austin, 1986, 1988). These deficits are typically interpreted as suggesting impairments or abnormalities in limbic neural networks, most notably abnormal processing in the amygdala and the amygdala-orbitofrontal circuitry (Birbaumer et al., 2005; Blair, Colledge, Murray, & Mitchell, 2001; Kiehl, Bates, Laurens, Hare, & Liddle, 2006; Kiehl et al., 2001; Kosson et al., 2002; Mitchell & Gluchrist, 2006; Nussbaum, 2006; Peplrey, Morris, McCarthy, & LaBar, 2007; Raine, Buchsbaum, & LaCasse, 1997; Raine et al., 1998; Raine & Yang, 2006; Richell et al., 2005). Please note that although the amygdala has traditionally been considered to be important only for processing of negative affective stimuli (Adolphs, Russell, et al., 1999; Adolphs, Tranel, et al., 1999), more recent research suggests that brain circuits that include the amygdala play a role in the processing of positive emotions as well (Burgdorf & Panksepp, 2006; Hamann, Ely, Hoffman, & Kilts, 2002; Lee et al., 2004; Liberzon, Phan, Decker, & Taylor, 2003).

The fact that child molesters have been shown to have smaller than usual amygdala, particularly in the right cerebral hemisphere (Schlitz et al., 2007), suggests that this group of offenders may also be characterized by AR deficits. However, because most research on neurocognitive and neuroaffective functioning and structural abnormalities among sex offenders against children has examined child molesters on the whole, nothing is known about whether pedophilic and nonpedophilic molesters differ from each other, or from nonoffenders, with respect to their affective processing. The answer to this question may contribute to our understanding of the etiology of child molestation in these two groups.

In summary, structural and functional temporal-limbic abnormalities, including abnormalities in the amygdala, have been identified among child molesters on the whole. Among pedophilic molesters, such abnormalities have been suggested to play a role in paraphilic tendencies, such as uncontrollable desire to approach children sexually. Although nonpedophilic child molesters are not characterized by the same paraphilic drive toward sexual activity with children, they nevertheless also appear to be marked by temporal-limbic abnormalities. Such abnormalities can be associated with deficits in the ability to recognize and understand affective displays in others, which can lead to a lack of empathy and tendencies toward callousness and cruelty. We know of no studies that have examined affective processing in this discrete population. The purpose of the present study was to test the hypothesis that nonpedophilic child molesters (as compared to pedophiles and nonoffender controls) would be characterized by abnormal affective processing, namely, poor ability to recognize facial and prosodic affective cues in others.

## Method

### Participants

Participants were 67 males, including 46 men convicted of having sexually offended against a child younger than 13 years of age, recruited from three Utah sex offender treatment sites, and 21 male nonoffending controls (CNTs) recruited from the community. Sex offenders were divided into two groups: (a) those characterized by a primary sexual interest in prepubescent children (younger than 13 years of age), referred to below as *pedophilic* (PED,  $n = 22$ ), and (b) those who, despite having offended against a prepubescent child, exhibited a primary sexual interest in adults, referred to as *nonpedophilic* (N-PED,  $n = 24$ ). Offenders' pedophilic status was established, as necessary, in several steps, utilizing procedures typically used in this type of research (e.g., Cantor et al., 2008). First, those few child molesters who acknowledged to either their therapist or the study interviewer that they were primarily sexually interested in children were included in the pedophile group. Second,

**Table 1**  
**Demographic Characteristics of the Sample**

	Pedophilic Child Molesters ( <i>n</i> = 18)		Nonpedophilic Child Molesters ( <i>n</i> = 23)		Community Controls ( <i>n</i> = 21)	
Age (years)	34.11	(7.48)	31.00	(6.61)	30.76	(8.58)
Education (years)	12.39	(2.38)	12.35	(1.50)	13.24	(2.00)
Full Scale IQ estimate	106.59	(5.49)	102.05	(8.23)	105.62	(8.42)
PSI total	350.72	(39.22)	382.91	(46.33)	372.33	(32.22)
Non-Caucasian (%)	5.60		13.00		19.00	
Non-right-handed (%)	22.00		17.00		5.00	

Note: Full Scale IQ estimate was based on Shipley Institute of Living Scale Wechsler Adult Intelligence Scale-Revised IQ estimate; PSI = Psychopathic Symptom Inventory. Standard deviations are presented in parentheses.

there were results from penile plethysmography (PPG) available for almost all of the offenders, having been administered routinely prior to their participation in this study. Among offenders with interpretable PPGs (who did not admit to being pedophilic), those evidencing greater arousal to prepubescent (male or female) stimuli than to adult (male or female) stimuli were included in the pedophile group, while those evidencing greater arousal to the adult than the prepubescent stimuli were considered nonpedophilic. Finally, for the few child offenders who did not admit to being pedophiles and for whom valid PPG data were unavailable, Seto's Screening Scale for Pedophilic Interests (SSPI; Seto, Harris, Rice, & Barbaree, 2004; Seto & Lalumiere, 2001) was completed. Those scoring 4 or higher on this four-item scale were considered to be pedophiles, while those scoring 0 or 1 were considered to be nonpedophiles.

Sexual interest was determined based on the results of previously administered PPG, offender admission to pedophilic preferences (confirmed by the offender's therapist), or scores on the SSPI, a quantitative tool designed to determine pedophilic interest in adult males.

From this initial sample, 4 PEDs and 1 N-PED were removed due to extremely outlying values on affective measures as defined by the SPSS Version 14 Explore program (default settings). This resulted in the final sample of 62 participants (21 CNTs, 18 PEDs, and 23 N-PEDs). Demographic characteristics of the sample can be found in Table 1.

As can be seen from Table 1, groups were comparable for age, education, and estimated IQ. However, N-PEDs appeared to have greater psychopathic tendencies than PEDs,  $t(39)2.36, p = .023$ .

## Instruments

*Shipley Institute of Living Scale-Revised (SILS; Zachary, 1986)*. The SILS was used to estimate intelligence. It consists of 40 vocabulary items and 20 analytical reasoning items and contains normative tables for converting performances into Wechsler Adult Intelligence Scale-Revised (WAIS-R) Full Scale IQ estimates.

*Handedness Questionnaire (Chapman & Chapman, 1987)*. This questionnaire consists of 13 handedness questions.

*Psychopathic Personality Inventory (Lilienfeld & Andrews, 1996)*. This is a well-validated (Patrick, Edens, Poythress, Lilienfeld, & Benning, 2006) 187-item self-report questionnaire measuring personality traits characteristic of psychopathy.

*Facial affect recognition task*. This task consisted of the presentation of male and female faces expressing happy, sad, angry, fearful, disgusted, and surprised facial expressions. Stimuli were the well-known and previously validated *Pictures of Facial Affect* (Eckman, Friesen, & Tomkins, 1971). Photographs were presented on a computer screen for 1.5 seconds each. Participants were instructed to respond as fast as they could, classifying photographs into the six emotion categories. Participants responded by pressing keys on the computer keyboard that bore labels corresponding to the six emotions. This task generated total number of errors and the median response time across all six emotions as well as number of errors and median response time for each individual emotion.

*Prosody perception task*. This task is a part of the New York Emotion Battery (Borod, Welkowitz, & Obler, 1992). It consists of presentation of sentences with emotionally neutral content that are read in seven different emotional tones: happy, sad, angry, fearful, disgusted, pleasantly surprised, and unpleasantly surprised. Sentences are prerecorded and validated as part of battery development. This task generated both a total number of errors across all emotions as well as numbers of errors for individual emotions.

## Procedures

All participants were recruited using flyers posted in the community (for controls) or at the sex offender treatment centers (for offenders). All participants first underwent standard institutional review-approved informed consent procedures and a brief interview. Next, participants completed a brief neurologic history questionnaire, a handedness questionnaire, an IQ screen, and the Psychopathy Screening Instrument. Following these initial procedures, participants completed a facial affect

**Table 2**  
**Zero-Order Correlations Among Affective And Demographic Variables**

	Age	Education	FAR Latency	FAR Errors
Education	.164			
FAR latency	.298*	.162		
FAR errors	-.216	-.073	.164	
APP errors	-.032	.025	.148	.205

Note: FAR = facial affect recognition; APP = affective prosody perception.

\* $p < .05$ .

recognition task and prosody perception task as part of a larger neurocognitive battery used for another study.

## Results

### Preliminary Analyses

*Error rates.* To ensure that participants did not respond randomly to stimuli, we examined the accuracy rates, both overall and for individual emotions. Overall accuracy ranged from 54% to 95%, demonstrating performance accuracies that were well above chance (i.e., 17%). In addition, because prior research has shown differential difficulty across individual emotions (with happiness being the easiest to recognize), we examined whether error rates varied across emotion types. As expected, there was a clear variability in accuracy depending on the type of emotion,  $\chi^2 = 141$ ,  $df = 5$ ,  $p < .001$ , with happiness showing the greatest accuracies. These results demonstrate that participants responded to the task in good faith.

*Skewness check.* Because both response latencies and error rates on facial affect recognition tasks can be considerably skewed (Kosson et al., 2002), we examined skewness coefficients for all variables of interest. We found skewness for response latency composite (i.e., the mean value across all six emotions). Log10 transformation was used to normalize this variable.

*Zero-order correlations.* Table 2 presents a correlation matrix among the AR variables and demographic characteristics. As can be seen, age was slightly related to performance speed on the facial affect recognition (FAR) task, likely due to decreases in processing speed known to be associated with increases in age (PsyCor, 1997).

### Principal Analyses

*Overall multivariate profile of performance.* First, to examine the overall pattern of performance across affective prosody perception (APP) and facial affect recognition, we conducted a multivariate analysis of covariance (MANCOVA), using (1) the total numbers of errors for both APP and FAR and latencies for FAR as dependent variables and (2) offender status (group: PED vs. N-PED vs. CNT) as the independent variable. In addition, given the observed association of age with performance on FAR, we also used age as a covariate. The results yielded a main effect of group, demonstrating that the three groups were characterized by different patterns of performance across the three dependent variables, Wilks's Lambda (6, 112) = 2.61,  $p = .021$ , and suggesting that further examination of the performance profiles was warranted.

*Affective processing channel: Visual versus auditory.* To further characterize the previously identified differences in performance profiles, we next examined the profile of performance with respect to visual versus auditory affective channels (channel: APP vs. FAR). This analysis only included error data as speed data were not available for the APP task. In particular, we conducted a mixed model analysis of variance, using APP errors and FAR errors as dependent variables. Group as the between-subjects factor, age as a covariate, and Channel as the within-subjects factor. The results yielded a main effect of Group,  $F(2, 58) = 3.84$ ,  $p = .027$ .

Follow-up analyses revealed that overall (i.e., across both Channels), N-PEDs performed more poorly than CNTs,  $F(1, 41) = 5.73$ ,  $p = .021$ , and had a trend toward performing more poorly than PEDs,  $F(1, 38) = 3.65$ ,  $p = .064$ . PEDs did not differ from CNTs, and there were no interactions between Group and Channel. This finding suggests that although the groups may have differed from one another with respect to accuracy of overall receptive affective processing, they were not characterized by unique profiles of strengths and weaknesses across visual versus auditory affective processing (i.e., FAR vs. APP, respectively). This finding also suggested that it was appropriate to collapse error data across APP and FAR tasks for subsequent analyses. To that end, we converted the APP and FAR error data to  $z$  scores and created a composite score (error composite) used for additional analyses. See Table 3 for estimated marginal means and standard errors.

*Mode of assessment: Speed versus accuracy.* Next, we examined the profile of performance with respect to mode of assessment (mode: speed vs. accuracy) to characterize profiles that might, for example, suggest fast or impulsive responding, versus profiles that might suggest performances that are both slow and inaccurate. In particular, we again conducted a mixed model analysis of covariance (ANCOVA), using error composite and FAR response latencies as the dependent variables, Group as the between-subjects factor, age as a covariate, and Mode as the within-subjects

**Table 3**  
**Estimated Marginal Means and Standard Errors of the Mean for Number of Errors for Facial Affect Recognition (FAR), Affective Prosody Perception (APP), and Total Across the Two Conditions**

	Pedophilic Child Molesters ( <i>n</i> = 18)		Nonpedophilic Child Molesters ( <i>n</i> = 23)		Community Controls ( <i>n</i> = 21)	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
FAR errors	-.322	.227	.389	.199	-.150	.208
APP errors	.051	.236	.279	.206	-.349	.216
Total errors	-.135	.176	.334	.154	-.250	.162

factor. The results yielded a significant interaction between Group and Mode,  $F(2, 58) = 5.27, p = .008$ , with no significant main effects. As can be seen in Figure 1 (with errors and latencies converted to *z* scores for easier pictorial comparison), these results reflect a different profile of strengths and weaknesses across the three groups. Follow-up analyses revealed that in addition to the previously identified differences with respect to error data (reported previously under channel of processing analyses), there were no reliable group differences with regard to speed of performance. This profile shows that while N-PEDs make more errors than both of the other groups, all three groups are comparable with respect to speed.

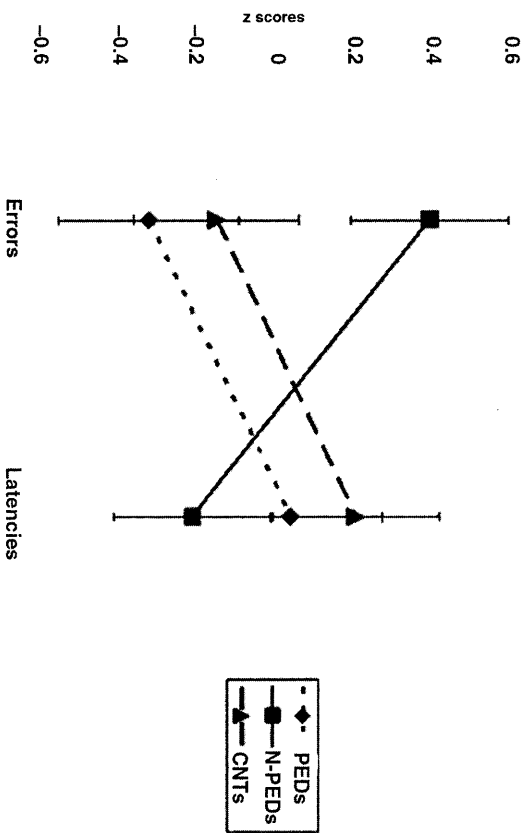
### Supplementary Analyses

Because our prior research suggests that some populations may be characterized by weaknesses in processing specific emotions (Kosson et al., 2002), we conducted supplementary analyses in which we examined the groups' performances on individual emotions. Given their exploratory nature, these analyses need to be interpreted cautiously and are offered as a means to generate hypotheses for future studies. These analyses yielded the following unadjusted least significant difference *p* values.

First, N-PEDs made more errors than CNTs when classifying facial disgust ( $p = .026$ ), prosodic unpleasant surprise ( $p = .013$ ), and prosodic interest ( $p = .002$ ). Given the relatively elevated levels of psychopathy in the present sample of N-PEDs (compared to the other groups), poorer recognition of facial disgust is consistent with prior research showing disgust recognition deficits among psychopaths (Kosson et al., 2002). Second, N-PEDs were faster at recognizing facial anger than CNTs ( $p = .035$ ). This finding is also consistent with our prior research conducted with psychopaths (Kosson et al., 2002).

Third, N-PEDs were more likely than CNTs to misinterpret other facial emotions as happiness ( $p = .021$ ) and anger ( $p = .042$ ). They were also more likely than PEDs to misinterpret other emotions as fear ( $p = .048$ ).

**Figure 1**  
**Errors and Latencies (Converted to *z* Scores) for Affective Processing Among Pedophilic Child Molesters (PEDs), Nonpedophilic Child Molesters (N-PEDs), and Community Controls (CNTs)**



And fourth, PEDs and N-PEDs both may perform more poorly than CNTs on recognizing prosodic sadness ( $p = .052$  and  $p = .054$ , respectively).

### Discussion

The present study examined affect recognition abilities among pedophilic and nonpedophilic child molesters. The results showed that N-PEDs made more errors than PEDs and controls with respect to both facial affect recognition and prosodic affect recognition. The results also demonstrated that N-PEDs' lesser accuracy was not accompanied by slower performance, and may in fact have been accompanied by a somewhat faster performance as compared to the other groups (see Figure 1). However, this pattern did not appear to be due to speed-accuracy trade-offs, as no inverse relationship was found between errors and accuracy (see Table 2). As such, this result likely reflects potentially somewhat impulsive responding among N-PEDs, accompanied by a somewhat lesser ability to understand facial affect regardless of

response speed. Finally, in addition to group difference with respect to affective processing, N-PEDs also appeared to exhibit greater psychopathic tendencies as compared to PEDs. These findings are discussed in more detail next.

*Psychopathy and AR deficits.* Psychopathy and pedophilia are known factors in sexual offending against children (e.g., Seto, 2008). Given that N-PEDs were found to be somewhat higher on psychopathy traits than the other groups (Table 1), it is possible that AR deficits in this population were not specific to sexual offending against children but rather to psychopathy. In particular, although the literature is somewhat inconsistent, a number of studies has found that psychopathy is associated with deficits in emotional processing in general (Bozikas, Kosmids, Anezoulaki, Giannakou, & Karavatos, 2004; Habel et al., 2002; Hale, Goldstein, Abramowitz, Calamari, & Kosson, 2004; Kiehl et al., 2001; Kiehl, Smith, Forster, & Hare, 1995; Mathiesen, Farster, & Svendsen, 2004; Williamson, Harpur, & Hare, 1991), and several studies have found that criminal psychopaths have deficits specifically in the processing of facial affect (Kosson et al., 2002; Patrick, Cuthbert, & Lang, 1994). Because one of the characteristics of psychopathy is indiscriminate sexual activity with a variety of sex targets (Cleckley, 1976; Hare, 1996), it is possible that psychopathy, in addition to AR deficits, contributes the N-PEDs' sex offenses against children.

It should also be noted that in addition to demonstrating general deficits in AR, N-PEDs also exhibited difficulties with specific emotions. This result is also consistent with prior findings among psychopaths. In particular, it has been shown that psychopaths may be particularly deficient at recognizing facial disgust (Kosson et al., 2002), as is the case in the present study. In addition, N-PEDs appeared to be faster at recognizing facial anger and exhibited a tendency to misinterpret other emotions as anger. These findings are also consistent with our prior study (Kosson et al., 2002), in which we found that psychopaths were more accurate than nonpsychopaths with respect to classification of anger. Although we did not examine response latencies in that study, the past and current findings together suggest that psychopaths and/or N-PEDs may be characterized by a tendency to rapidly and impulsively interpret a variety of emotional displays as anger, which results in more errors on other emotions but faster and more accurate responding to anger stimuli.

However, it should be noted that in the present study psychopathy was only screened using a self-report questionnaire. It is not clear how the participants in the present study would be classified had they undergone more thorough diagnostic procedures following the Hare Psychopathy Checklist. Thus, although the present findings suggest the possibility that psychopaths and N-PEDs share certain affective processing styles, this contention needs to be examined more carefully in future research in which psychopathy would be assessed more thoroughly.

*Etiology of AR deficits.* AR deficits can be present among individuals who have suffered various forms of brain injury (Borod, Bloom, Brickman, Nakhutina, & Curko, 2002), primarily affecting the right cerebral hemisphere (Blonder, Burns, Bowers, Moore, & Heilman, 1993; Blonder et al., 2005; Borod et al., 1998, 2002; Kucharska-Pietura, Phillips, Gernand, & David, 2003; Ross, Thompson, & Yenkosky, 1997), as well as a variety of populations suffering from neuro-psychiatric or neuro-developmental disorders, such as schizophrenia (Bozikas et al., 2004, 2006; Sachs, Steger-Wuchse, Kryspin-Exner, Gur, & Katschnig, 2004; Whitaker, Deakin, & Tomenson, 2001), mood disorder (Leppanen, 2006; Parker, Prkachin, & Prkachin, 2005; Persad & Polivy, 1993; Summers, Papadopoulou, Bruno, Cipolotti, & Ron, 2006), substance abuse (Folisy et al., 2005; Korreich et al., 2001; Monnot et al., 2001; Monnot, Lovallo, Nixon, & Ross, 2002; Uekermann, Daum, Schiebusch, & Treckmann, 2005), and fetal alcohol syndrome (Monnot et al., 2002). Given that criminal offenders in general (and child molesters in particular) tend to exhibit higher than normal rates of both neurodevelopmental perturbations (Cantor et al., 2005) and acquired brain injury (Blanchard et al., 2002, 2003), it is possible the offenders' problems with AR are secondary to other neuropsychiatric abnormalities.

*Limitations.* Several aspects of the present study limit interpretation of the results. First, the APP task does not allow for assessment of response latency. This is a function of the task design and could be remedied in future research by converting the current task into one that is administered electronically. Having response latencies available would provide additional information regarding the legitimacy of collapsing across the FAR and APP tasks.

In addition, it would be helpful if future research compared pedophilic and nonpedophilic child molesters to convicted felons who have not committed a sex crime to determine to what degree present findings are specific to child molester groups.

And finally, as is the case in virtually all research with offenders, our study is potentially confounded by the fact that only apprehended offenders were examined. Clearly, recruitment of child molesters who have not been apprehended represents a considerable challenge in this type of research.

## References

- Abel, G. G., & Osborn, C. (1992). The paraphilias: The extent and nature of sexually deviant and criminal behavior. *Psychiatric Clinics of North America, 15*, 675-687.
- Adolphs, R., Russell, J. A., & Tranel, D. (1999). A role for the human amygdala in recognizing emotional arousal from unpleasant stimuli. *Psychological Science, 10*, 167-171.
- Adolphs, R., Tranel, D., Hamann, S., Young, A. W., Calder, A. J., Phelps, E. A., et al. (1999). Recognition of facial emotion in nine individuals with bilateral amygdala damage. *Neuropsychologia, 37*, 1111-1117.

- Aigner, M., Eher, R., Fruehwald, S., Frotter, P., Gutierrez-Lobos, K., & Dwyer, S. M. (2000). Brain abnormalities and violent behavior. *Journal of Psychology & Human Sexuality, 11*(3), 57-64.
- Andkarsater, H. (2006). Central nervous changes in social dysfunction: Autism, aggression, and psychopathy. *Brain Research Bulletin, 69*, 259-265.
- Arnett, P. A., Howland, E. W., Smith, S. S., & Newman, J. P. (1993). Autonomic reactivity during passive avoidance in incarcerated psychopaths. *Personality & Individual Differences, 14*, 173-184.
- Baird, A. D., Wilson, S. J., Bladin, P. F., Saling, M. M., & Reutens, D. C. (2002). Hypersexuality after temporal lobe resection. *Epilepsy & Behavior, 3*, 173-181.
- Barsetti, I., Earls, C. M., Lalumiere, M. L., & Belanger, N. (1998). The differentiation of intrafamilial and extrafamilial heterosexual child molesters. *Journal of Interpersonal Violence, 13*, 275-286.
- Bergeon, T. K., & Valliant, P. M. (2001). Executive function and personality in adolescent and adult offenders vs. non-offenders. *Journal of Offender Rehabilitation, 33*(3), 27-45.
- Birbaumer, N., Veit, R., Lotze, M., Erb, M., Hermann, C., Grodd, W., et al. (2005). Deficient fear conditioning in psychopathy: A functional magnetic resonance imaging study. *Archives of General Psychiatry, 62*, 799-805.
- Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. V. (2001). A selective impairment in the processing of sad and fearful expressions in children with psychopathic tendencies. *Journal of Abnormal Child Psychology, 29*, 491-498.
- Blanchard, R., Cantor, J. M., & Robichaud, L. K. (2006). Biological factors in the development of sexual deviance and aggression in males. In H. E. Barbaree & W. L. Marshall (Eds.), *The juvenile sex offender* (2nd ed., pp. 77-104). New York: Guilford.
- Blanchard, R., Christensen, B. K., Strong, S. M., Cantor, J. M., Kuban, M. E., & Klassen, P. E. (2002). Retrospective self-reports of childhood accidents causing unconsciousness in phallometrically diagnosed pedophiles. *Archives of Sexual Behavior, 31*, 511-526.
- Blanchard, R., Kuban, M. E., Klassen, P. E., Dickey, R., Christensen, B. K., & Cantor, J. M. (2003). Self-reported head injuries before and after age 13 in pedophilic and non-pedophilic men referred for clinical assessment. *Archives of Sexual Behavior, 32*, 573-581.
- Blonder, L. X., Burns, A. F., Bowers, D., Moore, R. W., & Helman, K. M. (1993). Right hemisphere facial expressivity during natural conversation. *Brain and Cognition, 21*, 44-56.
- Blonder, L. X., Helman, K. M., Ketserson, T., Rosenbek, J., Raymer, A., Crosson, B., et al. (2005). Affective facial and lexical expression in aprosodic versus aphasic stroke patients. *Journal of the International Neuropsychological Society, 11*, 677-683.
- Bogaert, A. F. (2001). Handedness, criminality, and sexual offending. *Neuropsychologia, 39*, 465-469.
- Borod, J. C., Bloom, R. L., Brickman, A. M., Nakhutin, L., & Curko, E. A. (2002). Emotional processing deficits in individuals with unilateral brain damage. *Applied Neuropsychology, 9*, 23-36.
- Borod, J. C., Cicero, B. A., Ohler, L. K., Welkowitz, J., Erhan, H. M., Samtschi, C., et al. (1998). Right hemisphere emotional perception: Evidence across multiple channels. *Neuropsychology, 12*, 446-458.
- Borod, J. C., Welkowitz, J., & Ohler, L. K. (1992). *The New York Emotion Battery*. New York: Mount Sinai Medical Center.
- Borzikas, V. P., Kosmidis, M. H., Anezoulaki, D., Giannakou, M., Andreou, C., & Karavatos, A. (2006). Impaired perception of affective prosody in schizophrenia. *Journal of Neuropsychiatry and Clinical Neuroscience, 18*, 81-85.
- Borzikas, V. P., Kosmidis, M. H., Anezoulaki, D., Giannakou, M., & Karavatos, A. (2004). Relationship of affect recognition with psychopathology and cognitive performance in schizophrenia. *Journal of the International Neuropsychological Society, 10*, 549-558.
- Brower, M. C., & Price, B. H. (2001). Neuropsychiatry of frontal lobe dysfunction in violent and criminal behavior: A critical review. *Journal of Neurology, Neurosurgery & Psychiatry, 71*, 720-726.
- Burgdorf, J., & Panksepp, J. (2006). The neurobiology of positive emotions. *Neuroscience & Biobehavioral Reviews, 30*, 173-187.
- Cantor, J. M., Kaban, N., Christensen, B. K., Zipsursky, R. B., Barbaree, H. E., Dickey, R., et al. (2008). Cerebral white matter deficiencies in pedophilic men. *Journal of Psychiatric Research, 42*, 167-183.
- Cantor, J. M., Klassen, P. E., Dickey, R., Christensen, B. K., Kuban, M. E., & Blak, T. (2005). Handedness in pedophilia and hebephilia. *Archives of Sexual Behavior, 34*, 447-459.
- Carr, M. B., & Lufjemeier, J. A. (2005). The relation of facial affect recognition and empathy to delinquency in youth offenders. *Adolescence, 40*, 601-619.
- Chapman, L. J., & Chapman, J. P. (1987). The measurement of handedness. *Brain and Cognition, 6*, 175-183.
- Cleckley, H. (1976). *The mask of sanity* (5th ed.). St. Louis, MO: C. V. Mosby.
- Cohen, L. J., & Galynker, I. I. (2002). Clinical features of pedophilia and implications for treatment. *Journal of Psychiatric Practice, 8*, 276-289.
- Cohen, L. J., Nikiforov, K., Gans, S., Poznansky, O., McGeoch, P., & Weaver, C. (2002). Heterosexual male perpetrators of childhood sexual abuse: A preliminary neuropsychiatric model. *Psychiatric Quarterly, 73*, 313-336.
- Dolan, M., Deakin, W. J. F., Roberts, N., & Anderson, I. (2002). Serotonergic and cognitive impairment in impulsive aggressive personality disordered offenders: Are there implications for treatment? *Psychological Medicine, 32*, 105-117.
- Dolan, M., & Fullam, R. (2006). Face affect recognition deficits in personality-disordered offenders: Association with psychopathy. *Psychological Medicine, 36*, 1563-1569.
- Eckman, P., Friesen, W. V., & Tomkins, S. S. (1971). Facial affect scoring technique: A first validity study. *Semiotica, 3*, 37-58.
- Ericsson, T., & Lidberg, L. (1997). Increased plasma concentrations of the 5-HT precursor amino acid tryptophan and other large neutral amino acids in violent criminals. *Psychological Medicine, 27*, 477-481.
- Fior-Henry, P., Lang, R. A., Koles, Z. J., & Frenzel, R. R. (1991). Quantitative EEG studies of pedophilia. *International Journal of Psychophysiology, 10*, 253-258.
- Foisy, M.-L., Philippot, P., Verbanck, P., Pele, I., Van Der Straten, G., & Kornreich, C. (2005). Emotional facial expression decoding impairment in persons dependent on multiple substances: Impact of a history of alcohol dependence. *Journal of Studies on Alcohol, 66*, 673-681.
- Goldman, J. D. G., & Padyachi, U. K. (2000). Some methodological problems in estimating incidence and prevalence in child sexual abuse research. *Journal of Sex Research, 37*, 305-314.
- Gonkowsky, S. T., & Morgan, J. P. (2005). Neurobiological bases and neuropsychological correlates of aggression and violence. In J. P. Morgan (Ed.), *Psychology of aggression* (pp. 101-116). Hauppaug, NY: Nova Science Publishers.
- Gorey, K. M., & Leslie, D. R. (1997). The prevalence of child sexual abuse: Integrative review adjustment for potential response and measurement biases. *Child Abuse & Neglect, 21*, 391-398.
- Guay, J. P., Proulx, J., Cusson, M., & Ouimet, M. (1921). Victim choice polymorphism among serious sex offenders. *Archives of Sexual Behavior, 30*, 521-533.
- Habel, U., Kuehn, E., Salloum, J. B., Dewos, H., & Schneider, F. (2002). Emotional processing in psychopathic personality. *Aggressive Behavior, 28*, 394-400.
- Hale, L. R., Goldstein, D. S., Abramowitz, C. S., Calamari, J. E., & Kossou, D. S. (2004). Psychopathy is related to negative affectivity but not to anxiety sensitivity. *Behaviour Research & Therapy, 42*, 697-710.
- Hamann, S. B., Ely, T. D., Hoffman, J. M., & Kilts, C. D. (2002). Ecstasy and agony: Activation of human amygdala in positive and negative emotion. *Psychological Science, 13*, 135-141.
- Hare, R. D. (1996). Psychopathy: A clinical construct whose time has come. *Criminal Justice & Behavior, 23*, 25-54.
- Hucker, S., Langewin, R., Wortzman, G., & Bain, J. (1986). Neuropsychological impairment in pedophiles. *Canadian Journal of Behavioral Science, 18*, 440-448.
- Joyal, C. C., Black, D. N., & Dassylva, B. (2007). The neuropsychology and neurology of sexual deviance: A review and pilot study. *Sex Abuse, 19*, 155-173.
- Kawashima, S., Nakazawa, T., Kishiro, M., Seki, N., Hihara, H., & Ogura, K. (1999). A case of frontotemporal dementia with paraphilia. *Seishin Igaku (Clinical Psychiatry), 41*, 413-416.

- Kiehl, K. A., Bates, A. T., Laurens, K. R., Hare, R. D., & Liddle, P. F. (2006). Brain potentials implicate temporal lobe abnormalities in criminal psychopaths. *Journal of Abnormal Psychology, 115*, 443-453.
- Kiehl, K. A., Smith, A. M., Forster, B., & Hare, R. D. (1995). Protocol for a functional MRI study of semantic and affective processing in psychopaths. In D. J. Cooke, A. E. Forth, J. P. Newman, & R. D. Hare (Eds.), *Issues in criminological and legal psychology: No. 24, International perspective on psychopathy* (pp. 24-81). Leicester, UK: British Psychological Society.
- Kiehl, K. A., Smith, A. M., Hare, R. D., Mendrek, A., Forster, B. B., Brink, J., et al. (2001). Limbic abnormalities in affective processing by criminal psychopaths as revealed by functional magnetic resonance imaging. *Biological Psychiatry, 50*, 677-684.
- Klüver, H., & Bucy, P. C. (1939). Preliminary analysis of functions of the temporal lobes in monkeys. *Archives of Neurology and Psychiatry, 42*, 979-1000.
- Kornhuber, C., Blairy, S., Philippot, P., Dam, B., Foisy, M.-L., Hess, U., et al. (2001). Impaired emotional facial expression recognition in alcoholism compared with obsessive-compulsive disorder and normal controls. *Psychiatry Research, 102*, 235-248.
- Kosson, D. S., Suchy, Y., Mayer, A. R., & Libby, J. (2002). Facial affect recognition in criminal psychopaths. *Emotion, 2*, 398-411.
- Kucharska-Pietura, K., Phillips, M. L., Geman, W., & David, A. S. (2003). Perception of emotion from faces and voices following unilateral brain damage. *Neuropsychologia, 41*, 1082-1090.
- Langevin, R., Wortzman, G., Wright, P., & Handy, L. (1989). Studies of brain damage and dysfunction in sex offenders. *Annals of Sex Research, 2*, 163-179.
- Lapierre, D., Braun, C. M. J., & Hodgins, S. (1995). Ventral frontal deficits in psychopathy: Neuropsychological test findings. *Neuropsychologia, 33*, 139-151.
- Lee, G. P., Meador, K. J., Loring, D. W., Allsion, J. D., Brown, W. S., Paul, L. K., et al. (2004). Neural substrates of emotion as revealed by functional magnetic resonance imaging. *Cognitive and Behavioral Neurology, 17*, 9-17.
- Leppanen, J. M. (2006). Emotional information processing in mood disorders: A review of behavioral and neuroimaging findings. *Current Opinion in Psychiatry, 19*, 34-39.
- Lezak, M. D., Howleson, D. B., & Loring, D. W. (2004). *Neuropsychological assessment*. Oxford, UK: Oxford University Press.
- Liberson, I., Phan, K. L., Decker, L. R., & Taylor, S. F. (2003). Extended amygdala and emotional salience: A PET activation study of positive and negative affect. *Neuropsychopharmacology, 28*, 726-733.
- Lichtenfeld, S. O., & Andrews, B. P. (1996). Development and preliminary validation of a self-report measure of psychopathic personality traits in noncriminal populations. *Journal of Personality Assessment, 66*, 488-524.
- Maller, J. L., Sommer, M., Wagner, V., Lange, K., Taschler, H., Rader, C. H., et al. (2003). Abnormalities in emotional processing within cortical and subcortical regions in criminal psychopaths: Evidence from a functional magnetic resonance imaging study using pictures with emotional content. *Biological Psychiatry, 54*, 152-162.
- Mann, R. E., & Hollin, C. R. (2007). Sexual offender's explanations for their offending. *Journal of Sexual Aggression, 13*, 3-9.
- Mathiesen, B. B., Farster, P. L. V., & Svendsen, H. A. (2004). Affect regulation and loss of initiative in a case of orbitofrontal injury. *Neuro-psychanalysis, 6*, 47-62.
- McCabe, E. B., Pope, K., Hoheman, A. J., Pine, D. S., & Leibenluft, E. (2003). Facial expression recognition in adolescents with mood and anxiety disorders. *American Journal of Psychiatry, 160*, 1172-1174.
- McCown, W., Johnson, J., & Austin, S. (1986). Inability of delinquents to recognize facial affects. *Journal of Social Behavior & Personality, 1*, 489-496.
- McCown, W. G., Johnson, J. L., & Austin, S. H. (1988). Patterns of facial affect recognition errors in delinquent adolescent males. *Journal of Social Behavior & Personality, 3*, 215-224.
- Mendez, M. F., Chow, T., Ringman, J., Twitchell, G., & Hinkin, C. H. (2000). Pedophilia and temporal lobe disturbances. *Journal of Neuropsychiatry & Clinical Neurosciences, 12*, 71-76.
- Miller, E. (1999). The neuropsychology of offending. *Psychology, Crime & Law, 5*, 297-318.
- Mitchell, I. J., & Gilchrist, E. (2006). Domestic violence and panic attacks—Common neural mechanisms? *Legal and Criminological Psychology, 11*, 267-282.
- Momot, M., Lovallo, W. R., Nixon, S. J., & Ross, E. (2002). Neurological basis of deficits in affective prosody comprehension among alcoholics and fetal alcohol-exposed adults. *Journal of Neuropsychiatry and Clinical Neuroscience, 14*, 321-328.
- Momot, M., Nixon, S., Lovallo, W., & Ross, E. (2001). Altered emotional perception in alcoholics: Deficits in affective prosody comprehension. *Alcoholism: Clinical and Experimental Research, 25*, 362-369.
- Newman, J. P., Patterson, C. M., Howland, E. W., & Nichols, S. L. (1990). Passive avoidance in psychopaths: The effects of reward. *Personality & Individual Differences, 11*, 1101-1114.
- Nussbaum, D. (2006). Understanding psychopathy: Toward a psychobiological synthesis. *PSYCRITIQUEs, 51*(20).
- Ozmen, M., Erdogan, A., Duvenci, S., Ozyurt, E., & Ozkara, C. (2004). Excessive masturbation after epilepsy surgery. *Epilepsy & Behavior, 5*, 133-136.
- Pallone, N. J., & Voelbel, G. T. (1998). Limbic system dysfunction and inventoried psychopathology among incarcerated pedophiles. *Current Psychology, 17*, 57-74.
- Parker, P. D., Pkatchin, K. M., & Pkatchin, G. C. (2005). Processing of facial expressions of negative emotion in alexithymia: The influence of temporal constraint. *Journal of Personality, 73*, 1087-1107.
- Parsons, M. A. (1980). *The development and validation of the affect recognition and response scale, a measure of empathic ability*. Ann Arbor, MI: ProQuest Information & Learning.
- Patrick, C. J., Cuthbert, B. N., & Lang, P. J. (1994). Emotion in the criminal psychopath: Fear image processing. *Journal of Abnormal Psychology, 103*, 523-534.
- Patrick, C. J., Edens, J. F., Poythress, N. G., Lilienfeld, S. O., & Benning, S. D. (2006). Construct validity of the Psychopathic Personality Inventory two-factor model with offenders. *Psychological Assessment, 18*, 204-208.
- Pelphrey, K. A., Morris, J. P., McCarthy, G., & Labar, K. S. (2007). Perception of dynamic changes in facial affect and identity in autism. *Social Cognitive and Affective Neuroscience, 2*, 140-149.
- Persad, S. M., & Polivy, J. (1993). Differences between depressed and nondepressed individuals in the recognition of and response to facial emotional cues. *Journal of Abnormal Psychology, 102*, 358-368.
- PsyCor. (1997). *WAIS-III & WMS-III technical manual*. San Antonio, TX: The Psychological Corporation.
- Raine, A., Buchsbaum, M., & LaCasse, L. (1997). Brain abnormalities in murderers indicated by positron emission tomography. *Biological Psychiatry, 42*, 495-508.
- Raine, A., Meloy, J. R., Birhle, S., Stoddard, J., LaCasse, L., & Buchsbaum, M. S. (1998). Reduced prefrontal and increased subcortical brain functioning assessed using positron emission tomography in predatory and affective murderers. *Behavioral Sciences & the Law, 16*, 319-332.
- Raine, A., Park, S., Lencz, T., Birhle, S., LaCasse, L., Widom, C. S., et al. (2001). Reduced right hemisphere activation in severely abused violent offenders during a working memory task: An fMRI study. *Aggressive Behavior, 27*, 111-129.
- Raine, A., & Yang, Y. (2006). Neural foundations to moral reasoning and antisocial behavior. *Social Cognitive and Affective Neuroscience, 1*, 203-213.
- Richell, R. A., Mitchell, D. G. V., Peschardt, K. S., Winston, J. S., Leonard, A., Dolan, R. J., et al. (2005). Trust and distrust: The perception of trustworthiness of faces in psychopathic and non-psychopathic offenders. *Personality and Individual Differences, 38*, 1735-1744.
- Ross, E. D., Thompson, R. D., & Yenkosky, J. (1997). Lateralization of affective prosody in brain and the callosal integration of hemispheric language functions. *Brain and Language, 56*, 27-54.
- Sachs, G., Steger-Wachse, D., Kryspin-Exner, I., Gur, R. C., & Katsching, H. (2004). Facial affect recognition deficits and cognition in schizophrenia. *Schizophrenia Research, 68*, 27-35.

- Schiffer, B., Peschel, T., Gizewski, E., Forsting, M., Leygraf, N., Schedlowski, M., et al. (2007). Structural brain abnormalities in the frontostriatal systems and cerebellum in pedophilia. *Journal of Psychiatric Research, 41*, 753-762.
- Schlitz, K., Witzel, J., Northoff, G., Zierhut, K., Gubka, U., Fellmann, H., et al. (2007). Brain pathology in pedophilic offenders: Evidence of volume reduction in the right amygdala and related diencephalic structures. *Archives of General Psychiatry, 64*, 737-746.
- Seto, M. C. (2008). *Pedophilia and sexual offending against children: Theory, assessment, and intervention*. Washington, DC: American Psychological Association.
- Seto, M. C., Harris, G. T., Rice, M. E., & Barbaree, H. E. (2004). The screening scale for pedophilic interests predicts recidivism among adult sex offenders with child victims. *Archives of Sexual Behavior, 33*, 455-466.
- Seto, M. C., & Lalumière, M. L. (2001). A brief screening scale to identify pedophilic interests among child molesters. *Sexual Abuse: Journal of Research and Treatment, 13*, 15-25.
- Shanary-Tsoory, S. G., Tomer, R., Berger, B. D., & Aharon-Peretz, J. (2003). Characterization of empathy deficits following prefrontal brain damage: The role of the right ventromedial prefrontal cortex. *Journal of Cognitive Neuroscience, 15*, 324-337.
- Simonian, S. J., Beidel, D. C., Turner, S. M., Berkes, J. L., & Long, J. H. (2001). Recognition of facial affect by children and adolescents diagnosed with social phobia. *Child Psychiatry and Human Development, 32*, 137-145.
- Stone, M. H., & Thompson, E. H. (2001). Executive function impairment in sexual offenders. *Journal of Individual Psychology, 57*, 51-59.
- Strand, J. G. (1995). *The interpersonal constructs of pedophiles: Structural analysis of social behavior observer coding*. Unpublished doctoral dissertation, Department of Clinical Psychology, University of Utah, Salt Lake City.
- Suchy, Y., & Kosson, D. S. (2005). State-dependent executive deficits among psychopathic offenders. *Journal of the International Neuropsychological Society, 11*, 311-321.
- Summers, M., Papadopoulou, K., Bruno, S., Cipolletti, L., & Ron, M. A. (2006). Bipolar I and bipolar II disorder: Cognition and emotion processing. *Psychological Medicine, 36*, 1799-1809.
- Uekermann, J., Daum, I., Schabus, P., & Trenckmann, U. (2005). Processing of affective stimuli in alcoholism. *Cortex, 41*, 189-194.
- Whitaker, J. F., Deakin, J. F. W., & Tomenson, B. (2001). Face processing in schizophrenia: Defining the deficit. *Psychological Medicine, 31*, 499-507.
- Williamson, S., Harpur, T. J., & Hare, R. D. (1991). Abnormal processing of affective words by psychopaths. *Psychophysiology, 28*, 260-273.
- Wright, P., Nobrega, J., Langevin, R., & Wortzman, G. (1990). Brain density and symmetry in pedophilic and sexually aggressive offenders. *Annals of Sex Research, 3*, 319-328.
- Zachary, R. A. (1986). *Shipley Institute of Living Scale: Revised manual*. Los Angeles: Eastern Psychological Services.

## Individual Differences in the Propensity for Partner Sexual Coercion

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Lalumière, Harris, Quinsey, and Rice (2005) proposed a three-path model (psychopathy, young male syndrome, and competitive disadvantage) of the development of sexually coercive behavior, but none of these individual difference characteristics have been tested among partner rapists. Using a community sample in Study 1, the authors find that psychopathy is the only significant predictor of self-reported propensity for partner sexual coercion. This model is tested in Study 2 by comparing convicted partner rapists, non-sexual partner assaulters, and heterosexual child molesters. One third of partner rapists are psychopaths, and their psychopathy scores are no different from those found in correctional samples. Partner rapists have an average IQ, providing further evidence that competitive disadvantage is less characteristic of partner rapists. There is some indication that partner rapists desist with age. The authors discuss these findings in light of recent findings that implicate cuckoldry risk in partner sexual assault.

**Keywords:** *partner rape; psychopathy; competitive disadvantage; young male syndrome; individual differences*

**B**roadly defined, partner sexual coercion is the use of forceful or manipulative tactics to obtain sex from a nonconsenting partner (Camilleri, Quinsey, & Tapscott, in press). Although the psychological literature addressing sexual coercion in romantic relationships is small, a number of reports have provided prevalence rates, suggesting that a significant number of women have been sexually victimized by their partners. Depending on the definition of *sexual coercion*,<sup>1</sup> prevalence rates of partner sexual

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