Personality Disorders: Theory, Research, and Treatment

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Psychopathic and Externalizing Offenders Display Dissociable Dysfunctions When Responding to Facial Affect

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Despite similarity in their disinhibited behaviors, the cognitive-affective mechanisms that characterize psychopathy and externalizing are relatively distinct. One theoretical perspective suggests that psychopathy is associated with an early attention bottleneck that precludes the processing of contextual information, leading to a rigid goal-directed focus. Alternatively, externalizing may be associated with an overallocation of processing resources to motivationally salient information, which disrupts the use of cognitive control. In this study, male prisoners assessed on psychopathic and externalizing traits performed a new gaze detection task involving affective faces. As predicted, psychopathy but not externalizing was associated with superior performance on the gaze-detection task when the necessity of using contextual affect to regulate goal-directed behavior was minimized. Conversely, externalizing but not psychopathy was associated with increased errors on trials that required participants to use affective expressions, specifically fear, as a cue to inhibit dominant responses. These results have theoretical and applied significance for both psychopathic and externalizing forms of disinhibition. Recognition and utilization of facial affect are important for socialization and interpersonal interactions; therefore, any cognitive-affective processes that interrupt the fluency with which this information is processed may be important for understanding the underpinnings of disinhibition.

Keywords: attention, cognitive control, emotion, externalizing, psychopathy

Disinhibitory psychopathology is an umbrella term that includes a broad range of traits and behaviors that are epitomized by psychopathy and externalizing (Gorenstein & Newman, 1980; Krueger, Markon, Patrick, & Iacono, 2005; Patrick, Zempolich, & Levenston, 1997; Patrick & Zempolich, 1998; Poythress & Hall, 2011; Zuckerman, 1978). Psychopathic individuals are characterized by a combination of disinhibited traits (i.e., impulsivity, irresponsibility), a chronic antisocial lifestyle, and a variety of interpersonal and affective symptoms (i.e., callousness, glibness, superficial charm, shallow emotions) that entails great costs to society as well as for affected individuals (e.g., incarceration). Alternatively, externalizing represents a heritable predisposition to diverse forms of disinhibitory psychopathology (e.g., conduct disorder, antisocial personality disorder, trait impulsivity, and low constraint) that are associated with reactive aggression, low distress tolerance, heightened negative emotionality, excessive reward seeking, and poor impulse control (Buckholtz et al., 2010; Gorenstein & Newman, 1980; Krueger et al., 2005; Pridmore, Chamber, & McArthur, 2005; Newman & Lorenz, 2003). The distinction between psychopathy and externalizing is complicated by virtue of their overlapping behavior problems (e.g., impulsivity, criminality). However, the cognitive-affective deficits associated with psychopathy and externalizing are relatively distinct (Baskin-Sommers & Newman, 2013; Brazil et al., 2012; Cale & Lilienfeld, 2002; Patrick, Hicks, Krueger, & Lang, 2005). Increasingly, research is focused on distinguishing the deficits associated with these phenotypically similar syndromes, so as to improve the identification and treatment of these individuals (e.g., Frick, 2012; Patrick, 2007; Sargeant, Daughters, Curtin, Schuster, & Lejuez, 2011).

Most commonly, psychopathic individuals are described as emotionally 'cold.' Consistent with this description, these individuals display poor fear conditioning (Lykken, 1957), reduced reactivity to facial expressions (Marsh & Blair, 2008), and weak psychophysiological reactivity to aversive events (Birbaumer et al., 2005; Blair & Mitchell, 2009; Hare, 1978; Patrick et al., 1993). However, there is growing evidence that these emotion deficits are moderated by experimental context (Dadds et al., 2006; Decety et al., 2013; Meffert et al., 2013; Sadeh & Verona, 2012). Newman and colleagues propose that this context specificity is associated with a core dysfunction in the adaptive deployment of selective attention and may help to explain psychopathic individuals' shallow affect and disinhibited behavior. In particular, Baskin-Sommers et al. (2011) suggest that an early attention bottleneck impedes information processing in psychopathic individuals. The rationale for the attention bottleneck stems from models that characterize early selective attention as a "fixed bottleneck" that filters and processes information in serial (Driver, 2001) and, once

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established, limits the processing of information that conflicts with goal-directed behavior (e.g., peripheral information, different features in a complex array). Such a bottleneck creates an advantage for psychopaths in many situations that require individuals to filter potential distracters (Hiatt et al., 2004; Mitchell et al., 2006; Wolf et al., 2012; Zeier et al., 2009), but this advantage is counterbalanced by their reduced ability to attend to multiple ongoing streams of information (Baskin-Sommers, Curtin, & Newman, 2013; Glass & Newman, 2009; Kosson & Newman, 1986; Newman et al., 1990). Within this framework, this trade-off results in a tendency to overlook important information unless it is directly related to their goal-directed focus of attention.

In support of this model, across diverse experimental paradigms, such as passive avoidance learning, instructed fear conditioning, facial recognition tasks, and picture-viewing, psychopathic offenders display normal responses (e.g., in fear-potentiated startle, emotion-modulated startle, amygdala activation, electrodermal activity, behavioral reaction) to affective information when it is part of their goal-directed task, congruent with their preexisting set, or embedded in a perceptually simple display (Baskin-Sommers et al., 2013, 2011; Dadds et al., 2006; Newman et al., 2010; Sadeh & Verona, 2012; cf. Sylvers et al., 2011). Yet their reactions to the same affective stimuli are deficient, relative to nonpsychopathic offenders, if their attention has been allocated to an alternative, set-irrelevant, or complex aspect of the situation (see Newman & Baskin-Sommers, 2011 for review). Combined, these studies show that psychopathic participants are less sensitive to information if it is inconsistent with their pre-established filter (i.e., does not match dominant response), but display normal, and in some cases even increased, sensitivity to the same information when attending to that information is congruent with their filter (e.g., no alternative goals to consider; minimal complexity/demands on attention; Brazil et al., 2012; Glass & Newman, 2009; Hiatt et al., 2004; Newman & Kosson, 1986; Sadeh & Verona, 2008). Thus, according to the attention bottleneck model, psychopaths are insensitive to affective and inhibitory cues not because they are incapable of emotion responses or because they necessarily have deficits in inhibitory control, but because their failure to attend to contextual information while attention is focused elsewhere renders them oblivious to these cues.

In contrast to psychopathic individuals, externalizing individuals are typically described as emotionally 'hot.' These individuals display exaggerated reactivity to affective stimuli (Frick & Morris, 2004; Mullin & Hinshaw, 2007), have difficulty deploying executive functions (Endres et al., 2011), and struggle to regulate their intense emotional reactions (Malterer et al., 2008). Moreover, there is increasing evidence that such dysregulation and emotional hyper-reactivity in externalizing is associated with the overallocation of limited capacity processing resources to salient stimuli (Baskin-Sommers et al., 2012; Sadeh et al., 2008, 2013). Based on this evidence, it appears that externalizing individuals are prone to overallocate cognitive resources to potentially relevant stimuli in situations that foster an expectation that motivationally significant events will occur. And, moreover, that such overallocation depletes resources available for processing subsequent stimuli and the implementation of capacity limited executive functions (e.g., inhibition, shifting, and control) that normally modulate ongoing behavior (Baskin-Sommers & Newman, 2013; Baskin-Sommers et al., 2014; Wallace & Newman, 1997).

This proposal is consistent with externalizers' strong attentional orienting to salient cues (Avila & Parcet, 2001), dysregulated responding in the presence of salient goal stimuli (Bachorowski & Newman, 1990), exaggerated deficiency in identifying secondary targets in the attentional blink task (Baskin-Sommers, Wolf, Buckholtz, Warren, & Newman, 2012), failure to inhibit reward seeking responses (Patterson, Kosson, & Newman, 1987), difficulty classifying rare or unexpected stimuli in the oddball task (Bernat, Nelson, Steele, & Patrick, 2011; Costa et al., 2000), deficits in delay discounting during gambling tasks, and problems shifting their focus to inhibit drug craving (Volkow & Li, 2004) and violent responses (Blair, 2001). In each of these instances, externalizing individuals appear to react strongly to motivationally salient (e.g., unexpected information, reward, punishment, threat, etc.) information, particularly when they are already engaged in a practiced, dominant response. Thus, one potential explanation for externalizing individuals' disinhibition involves an inability to engage in cognitive control under affectively charged circumstances (i.e., deficient affective cognitive control; Sadeh et al., 2013).

Despite the fact that psychopathy and externalizing are associated with phenotypically similar manifestations of disinhibited behavior (e.g., aggression, substance abuse, and chronic antisocial behavior), research suggests that the syndromes are associated with distinct cognitive-affective dysfunctions. Consistent with an array of experimental findings, the disinhibited behavior of psychopathic individuals appears to reflect their obliviousness to the potential drawbacks associated with goal-directed behaviors (e.g., failure to attend to and process contextual information). Alternatively, for externalizing individuals, their disinhibition may stem from a tendency to overallocate cognitive resources toward motivationally salient information that saps capacity for implementing executive regulatory processes (e.g., failure to implement affective cognitive control). As mentioned above, though there are other potential cognitive-affective processes at play in psychopathy and externalizing, the primary aim of the present study was to examine and differentiate the unique psychopathy-related deficit in attention to context and the externalizing-related deficit in affective cognitive control under parallel experimental conditions.

To this end, we developed a new behavioral task that presents the same affective facial expressions under different circumstances. A variety of affective and motivational stimuli have been used to assess cognitive-affective functioning in disinhibitory psychopathology, however tasks employing facial stimuli are often the method of choice owing to their importance and ecological validity. The present task requires participants to focus on the eyes and press a button associated with the direction of the eye gaze, unless the affect associated with the eyes involves a particular (i.e., target) affective expression. In the presence of target facial expressions, participants are required to inhibit the button press associated with the direction of the eye gaze and respond by pressing the button that is associated with the opposite direction of the displayed eye gaze. In this way, the task establishes the target affective expression as the participant's primary focus of attention, but the remaining affective expressions are essentially irrelevant for performing the task. Based on the previous evidence indicating that psychopathic offenders are adept at processing primary, set-relevant, affective cues but deficient in processing set-irrelevant, affective information, we hypothesized that psychopathy would be associated with adequate modulation of behavior (i.e., no accuracy

differences) in response to primary affective stimuli (i.e., targets), and an enhanced ability to tune out nontarget affective expressions leading to superior performance (i.e., less interference from affective cues) on nontarget trials. Conversely, given the externalizing-related difficulty inhibiting dominant responses in the presence of motivationally significant stimuli, we hypothesized that externalizing would be associated with more frequent errors when required to modulate behavior in response to target emotions. On the other hand, externalizing should have little or no effect on participants' ability to indicate the actual direction of the eye gaze (i.e., on nontarget trials).

Method

Participants

Participants were 106 male inmates from a medium security prison in Southern Wisconsin. All participants were between the ages of 18 and 45 years, because psychopathy and impulsive behavior have been found to change with advancing age (Hare et al., 1990). Additionally, a prescreen of institutional files was used to exclude individuals who had performed below the fourth-grade level on a standardized measure of reading or math achievement, who scored below 70 on an estimate of IQ computed based on the Vocabulary and Matrix Reasoning subtests of the Wechsler Adult Intelligence Scale-Third Edition (Wechsler, 1997), or who had diagnoses of schizophrenia, bipolar disorder, or psychosis not otherwise specified. The intelligence cutoff and exclusion of major psychopathology were used primarily to reduce the contributions of these extraneous influences on the interview and behavioral assessments (see Table 1 for sample descriptive statistics).

Table 1
Sample and Task Descriptive Statistics (n = 106)

Variable	Mean	Standard deviation
Demographic		
Age (years)	31.37	6.82
Race (Percent of sample)		
White	66.00	—
Black	31.10	—
Asian	0.90	—
Native American	1.90	—
WAIS-IQ	99.26	12.09
Psychopathy (PCL-R)	21.91	7.34
Externalizing (ESI)	234.22	63.26
Task (Raw response accuracy, percent correct)		
Gaze-incongruent trials		
Anger	95.23	8.62
Fear	87.57	7.35
Happy	88.39	10.60
Gaze-congruent trials		
Anger	86.75	3.38
Fear	94.76	4.62
Happy	95.73	5.97
Neutral	86.42	18.39

Note. Table contains means or frequencies, where appropriate, in the middle column and standard deviations in the right column. PCL-R and ESI were correlated, $r(106) = .50$. WAIS-IQ = Wechsler Adult Intelligence Scale; PCL-R = Psychopathy Checklist-Revised; ESI = Externalizing Spectrum Inventory.

Psychopathy Checklist-Revised (PCL-R; Hare, 2003)

All participants were assessed for psychopathy using the PCL-R. This measure uses information gleaned from an interview and a review of institutional files to score the participant on the presence of 20 different items. A score of 0, 1, or 2, is given for each item according to the degree to which a characteristic is present. Thus, PCL-R total scores range from 0 to 40. The reliability and validity of the PCL-R is well established (see Hare, 2003; Hare et al., 1990). In this study, reliability ratings were available for 16 randomly selected participants. The interrater reliability for PCL-R total score was .99.

Externalizing Spectrum Inventory (ESI; Hall et al., 2007)

Externalizing was measured using the ESI, a 100-item self-report questionnaire developed to assess a broad range of behavioral (i.e., substance use) and personality characteristics (i.e., alienation, rebelliousness, and impulsivity) associated with the externalizing spectrum of psychopathology. The 100-item version was derived from Krueger et al.'s (2007) 415-item self-report measure and is correlated $r = .98$ with the original measure (Krueger et al., 2007). The total range of scores on the ESI is 100 to 400. For this sample the internal consistency (Cronbach's alpha) was .96.

Gaze Task

A stimulus set of 32 pictures was created from the Ekman Pictures of Facial Affect (Ekman, 1993) black and white photographs (female/male; 4 expressions: happy, angry, fear, neutral; 2 directions of eye-gaze: right, left). Although other facial expressions could also have been used, fear processing is widely studied in the field of psychopathy, anger is the most prominent and essential affective component of antisocial behavior (Granic & Bulter, 1998), and happy was selected to examine the effect of valence. All pictures were cropped to show the face in frontal view and to exclude the neck and haircut of the person. The stimuli were presented on a black background of a computer screen. Stimulus presentation was controlled using Matlab (Mathworks, MA).

Each trial started with a fixation cross, presented for 200 ms. The stimulus, a face looking left or right, was then presented for 1600 ms or until a response was registered. Finally, trials were separated by a 1500-ms interstimulus interval (see Figure 1). The task consisted of a total of 416 (32 practice and 384 experimental) trials. Each picture type (reflecting all permutations of four emotions, two genders, and two gaze directions) was displayed an equal number of times (once during practice and 12 times each during experimental trials).

This task consisted of two types of intermixed trials: gaze-congruent and gaze-incongruent. During gaze-congruent trials, participants were instructed to indicate if the eyes were looking left or right using a two-button response box (e.g., eyes looking right-press right button). These represented the majority of trials (75%) and helped to establish the dominant response. Additionally, for each participant, one of three affective faces (happy, fear, angry) was selected as the target facial affect, a stimulus that signified a change in response demands. In the presence of the target affect,

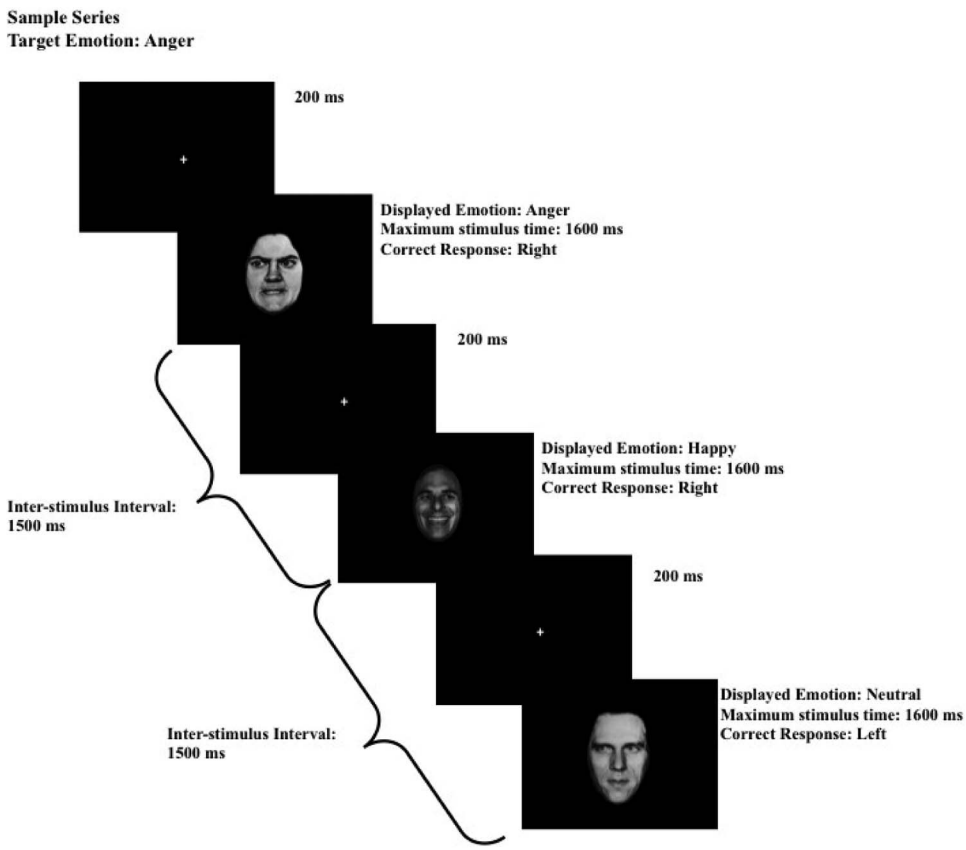

Figure 1. Schematic of task. Every trial began with a fixation cross lasting 200 ms, after which the stimulus, a face looking left or right, was presented for 1600 ms or until a response was registered. Finally, trials were separated by a 1500-ms interstimulus interval. At the start of the task one of the three affective faces (happy, fear, anger) was designated as the relevant affective expression. During gaze-congruent trials the affective expression on the face did not match the pre-established target emotion; participants were instructed to indicate whether the eyes were looking left or right using a two-button response box (e.g., eyes looking right – press right button). During gaze-incongruent trials, the affective expression on the face matched the target emotion. On these trials, participants were instructed to press the button that was opposite of the displayed the eye gaze (e.g., eyes looking left – press the right button).

participants were instructed to press the button that was opposite to the displayed eye gaze (i.e., gaze-incongruent), such that if the eyes were looking left individuals would press the right button and vice versa. Given the goal of examining the extent to which affect specifically disrupts processing in psychopathic and externalizing offenders, neutral faces were never selected as the target expression. These gaze-incongruent trials established the affective set (e.g., search for fear faces) and represented the minority (25%) of the trials. Selection of the target emotion was counterbalanced across participants. Participants were informed of their relevant emotion during the instructions at the start of the task.

These two different trial types placed different demands on process and task performance. On gaze-congruent trials, when the facial expression did not match the set-relevant target emotion, there was no need to process the expression because it was irrelevant for the task performance (i.e., because contextual information was unnecessary to inhibit the dominant response). However, on gaze-incongruent trials, the facial affect provides crucial, set-relevant, information. More specifically, participants had to register and use the fact that the affective expression matches the target so that they could alter the dominant gaze-congruent response on gaze-incongruent trials.

The two task conditions were designed to provide different manipulations of attention to context and affective cognitive control processing deficits. Given their deficit in attention to context, when the affective expression does not match their primary, target set, that is on gaze-congruent trials, psychopathic individuals should effectively ignore this information. Consequently, in contrast to less psychopathic individuals, the contextual affective information will have minimal impact on their response accuracy (i.e., less interference, resulting in greater accuracy). Conversely, when faced with information that matches their pre-established set (i.e., the target affect), on gaze-incongruent trials, individuals high and low on psychopathy will display comparable accuracy in responding to set-congruent information.

For externalizing individuals, their deficit in affective cognitive control will lead them to overallocate cognitive resources to facial expressions that match their motivational set (i.e., on gaze-

incongruent trials) to the point that it interferes with their ability to inhibit the dominant responses. Consequently, in contrast to individuals with lower externalizing scores, higher externalizing individuals will commit more inhibitory errors on gaze-incongruent trials; that is, when they must inhibit the dominant gaze-congruent response in the presence of affective facial expressions (i.e., on trials requiring affective cognitive control). Conversely, externalizing should not be related to performance differences on gaze-congruent trials, because these trials do not require cognitive control. That is, despite the presentation of affective cues that might engender exaggerated affective reactions in externalizing individuals, the consequences of such reactions are expected to be minimal in the absence of substantial situational demands on cognitive control. Though externalizing individuals have a tendency to overrespond to emotion information, this tendency does not appear to impact behavior unless processing emotion *and* employing cognitive control is required.

Procedure

Before the task began, participants were shown standard slides of happy, angry, fearful, and neutral faces and asked to identify the emotion. All participants were able to identify the facial affect successfully. They were then told the relevant (i.e., target) emotion and given instructions about the task, both verbally and on the computer screen. Participants were to indicate the direction of the gaze on gaze-congruent trials or the direction opposite of the gaze on gaze-incongruent trials by pressing one of two buttons with their dominant hand as quickly and accurately as possible. Participants were told to respond anytime after the face stimulus appeared on the screen.

Data Analysis

All analyses were accomplished within a General Linear Model (GLM). Analysis of task effects included repeated measures for Trial Type (2: gaze-congruent, gaze-incongruent) and a between subject regressor for Target Emotion (3: anger, fear, happy). Moderation analyses added quantitative regressors, simultaneously entered, for relevant individual difference measures (PCL-R and ESI, standardized) and performance on neutral trials. The simultaneous evaluation of psychopathy and externalizing allows us to test the hypothesis that the attention to context deficit is specific to psychopathic versus externalizing traits and the affective cognitive control deficit is specific to externalizing versus psychopathic traits (i.e., evaluate the unique association between psychopathy and obliviousness to contextual affective information; evaluate the unique association between externalizing and overreactivity to affective information hampering cognitive control; see Table 2 for zero-order and partial correlations).

Results

Task Analysis

As expected, participants responded significantly more accurately on gaze-congruent trials than on gaze-incongruent trials, $F(1, 103) = 101.93$, $p < .01$, $\eta_p^2 = .50$. There were no significant main effects or interactions involving emotion. These findings are consistent with the assumption that responding in a gaze-congruent manner is dominant and that inhibiting this response, on gaze-incongruent trials, requires cognitive control.

Individual Difference Analysis

Neither the main effect of psychopathy nor externalizing was significant (Psychopathy: $p = .66$; Externalizing: $p = .81$). As predicted, the psychopathy by trial type interaction was significant, $F(1, 96) = 4.67$, $p = .03$, $\eta_p^2 = .05$, with high scoring offenders, controlling for level of externalizing, displaying significantly greater accuracy than low scoring offenders on gaze-congruent trials ($B = .01$, $p = .01$) but no difference on gaze-incongruent trials ($B = -.01$, $p = .45$; see Figure 2). There was no psychopathy-related interaction involving target emotion (Psychopathy $\times$ Trial Type $\times$ Target Emotion, $p = .57$). In light of the fact that these analyses controlled for accuracy on neutral trials, these significant psychopathy-related differences indicate that individuals scoring high on psychopathy were less influenced by the contextual emotion cues than individuals scoring low on psychopathy.[1,2]

Additionally, while controlling for level of psychopathy, there was a significant externalizing by trial type by target emotion interaction, $F(2, 96) = 3.21$, $p = .04$, $\eta_p^2 = .06$, indicating that performance on gaze-incongruent trials varied as a function of the level of externalizing and specific target emotion, whereas performance on gaze-congruent trials was unrelated to externalizing scores (see Figure 3). Examination of the simple main effects within each target emotion indicated that as externalizing scores increased, accuracy on gaze-incongruent fear trials decreased sig-

[1] The primary analysis uses a simultaneous regression to examine the unique influence of psychopathy and externalizing while controlling for level on the other trait. For the sake of completeness we also conduced two separate GLM analyses, one looking just at the effects of psychopathy and the other looking at just the effects of externalizing on task performance. Consistent with the analyses reported in the Results section, there was a significant Psychopathy by Trial Type interaction, $F(1, 100) = 5.93$, $p = .02$, and a significant Externalizing by Trial Type by Target Emotion interaction, $F(1, 100) = 4.81$, $p = .01$.

[2] In addition to the continuous analysis we ran two grouped analyses. First, there is some evidence that the two psychopathy Factors can be used to model externalizing as well as psychopathic traits (Patrick et al., 2006). Given that psychopathy is classically defined as the combination of interpersonal-affective (i.e., Factor 1) and impulsive-antisocial (i.e., Factor 2) traits, participants who scored a 12 or above on Factor 2 and above the median on Factor 1 items were identified as psychopathic. Participants who scored a 12 or above on Factor 2, but below the median on Factor 1 items, were identified as externalizing (Patrick et al., 1993). In the second model, we created groups based on the PCL-R Total score and ESI-Total score using median splits. Consistent with the analyses reported in the Results section, both grouped analyses revealed a significant Psychopathy by Trial Type interaction (PCL-R Factors: $F(1, 42) = 6.92$, $p = .01$; Median Split Psychopathy: $F(1, 99) = 5.24$, $p = .02$), indicating that higher psychopathy scores were associated with superior accuracy on gaze-congruent trials, but that psychopathy scores were unrelated to accuracy on gaze-incongruent trials. Additionally, there was an Externalizing by Trial Type by Target Emotion interaction (PCL-R Factors: $F(2, 42) = 6.92$, $p < .01$; Median Split Externalizing: $F(2, 99) = 2.20 = .08$), which revealed that externalizing characterized offenders displayed worse accuracy on the gaze-incongruent trials, particularly fear trials, but the simple main effects were no longer significant. One disadvantage of grouped analyses is the loss of power, which likely impacted the significance of the effects reported in the Results section.

Table 2
Correlations (r = Zero-Order, r_p = Partial) Among Psychopathy, Externalizing, and Task-Related Accuracy

Task	Psychopathy		Externalizing	
	r	r_p	r	r_p
Gaze-incongruent all subtypes	−.07	.18	−.01	.03
Gaze-incongruent anger	−.11	.03	−.28	−.26
Gaze-incongruent fear	−.34	−.19	−.32*	−.15
Gaze-incongruent happy	.10	−.02	.29	.27
Gaze-congruent all subtypes	.52*	−.07	.15	.04
Gaze-congruent anger	.18	.09	.16	.15
Gaze-congruent fear	.29*	.13	.16	.10
Gaze-congruent happy	.12	.03	.17	.12
Gaze-congruent neutral	−.10	−.08	−.15	.05

Note. Analyses reported in Results section included psychopathy and externalizing in the regression simultaneously, as well as neutral trials as a covariate. Therefore, these correlations should be considered as supplementing the primary results but do not represent an exact match of the analyses reported in the text. Of note, the gaze-incongruent target affect was a between-subjects manipulation, therefore only a subset of the total sample is included in each correlation cell, whereas as all participants completed the gaze-congruent trials and are included in the corresponding correlations.
* $p < .05$.

nificantly ($B = -.03$, $p = .05$). The externalizing-related difference on anger ($B = -.02$, $p = .09$) gaze-incongruent trials was in the same direction as fear faces, though only a trend. Finally, accuracy on happy ($B = .03$, $p = .08$) gaze-incongruent trials, was positively related to externalizing, with offenders high on externalizing displaying greater accuracy. Affective neuroscience suggests that anger and fear are negatively valenced emotions and activate similar neural structures, whereas happy is a positively valenced emotion (Adolphs, Russell, & Tanel, 1999). Further analysis revealed that externalizing scores were significantly related to worse performance in the negatively valenced (anger and fear) gaze-incongruent trials ($B = -.03$, $p = .02$), and moderately related to better performance in the happy gaze-incongruent trials ($B = .03$, $p = .08$). Overall, the pattern of externalizing-related differences indicates that externalizing offenders were differentially affected by demands on affective cognitive control.

Discussion

To date, considerable progress has been made in specifying and differentiating the dysfunctional cognitive-emotion interactions that contribute to disinhibition in psychopathic and externalizing individuals. Based on this progress, Baskin-Sommers and Newman (2013) propose that psychopathic individuals are characterized by an early attention bottleneck that filters the processing of goal-incongruent, contextual information, resulting in a myopic perspective on decision-making and goal-directed behavior. Conversely, externalizing individuals may be characterized by a tendency to overallocate processing resources to motivationally relevant cues and display deficits in cognitive control when there is a match between pre-established priorities and environmental cues, resulting in affective and behavioral dysregulation. Using two conditions, which placed differential demands on attending to contextual cues and affective cognitive control, and behavioral accuracy as a measure of the downstream effects of regulatory processing, the present study sought to compare these cognitive-affective processes in a sample of offenders. Findings from the present study are largely consistent with these theoretical accounts of psychopathy and externalizing, and moreover, highlight that progress in understanding the serious behavior problems associated with these syndromes depends upon considering their divergent cognitive-affective dysfunctions (see Baskin-Sommers & Newman, 2013; Frick, 2012 for reviews).

Consistent with predictions, offenders high compared with those low on psychopathy were more accurate (i.e., displayed less interference, resulting in greater accuracy) on the gaze-congruent trials (i.e., trials with nontarget emotions). Recall that on these trials facial affect must be processed to the point of checking whether or not it involves the target affect, but need not be identified to respond. More specifically, once an individual determines that a facial expression is not consistent with a pre-established set involving the target emotion, there is no need to process the specific affective information before responding. The enhanced accuracy shown by psychopathic participants under these conditions is consistent with the proposal that they process information that matches their pre-established attentional set, but additional information, that does not match their filter, is processed to a lesser degree. Also consistent with the attention bottleneck model, psychopathic individuals were adept at processing facial affect when it matched their pre-established set, as evidenced by the absence of

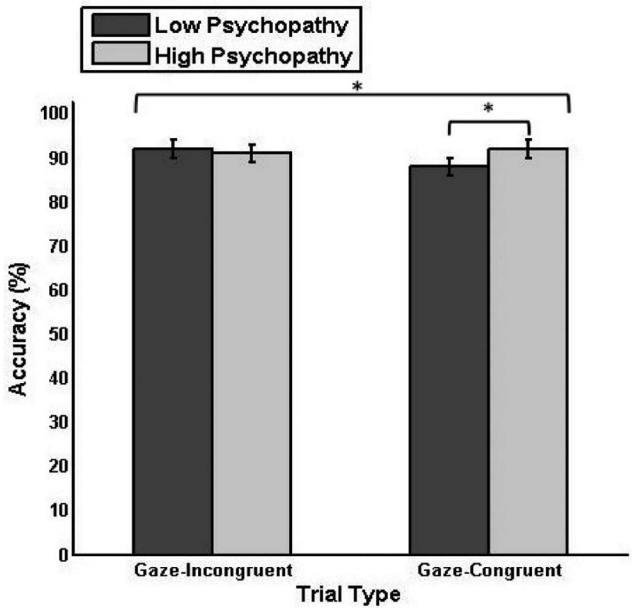

Figure 2. Results are shown for the gaze-congruent (right) and gaze-incongruent trials (left), controlling for performance in neutral trials. Raw psychopathy scores, estimated from the Psychopathy Checklist-Revised (Hare, 2003), were standardized (z scores; displayed point estimates are ± 1 *SD* from the mean). Error bars represent the standard errors for the point estimates. There was a significant psychopathy by trial type interaction. Offenders high on psychopathy compared with those low on psychopathy, controlling for level of externalizing, were more accurate on gaze-congruent trials (* denotes $p < .05$), but there were no psychopathy-related difference on gaze-incongruent trials.

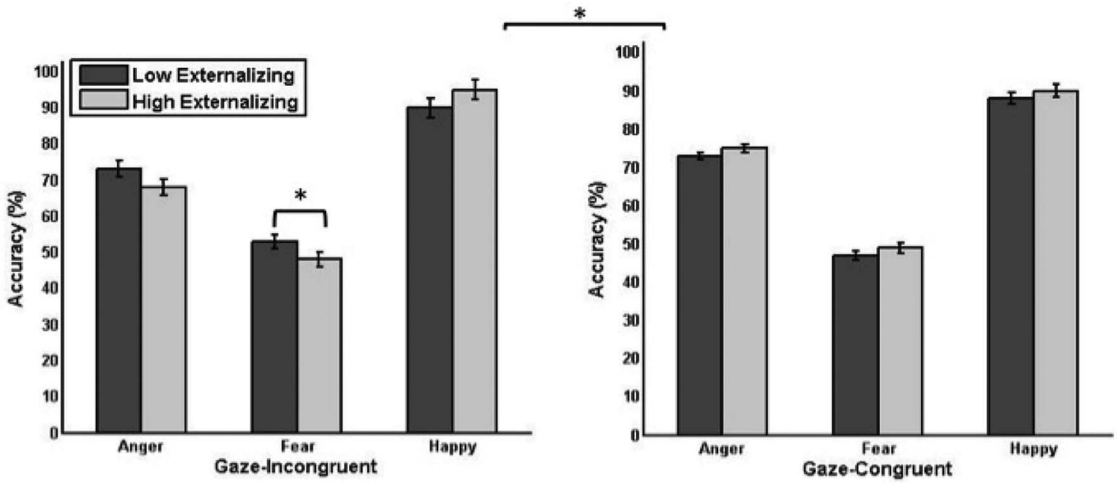

Figure 3. Results are shown for each emotion within gaze-congruent (right) and gaze-incongruent (left) trials, controlling for performance in neutral trials. Raw externalizing scores, estimated from the Externalizing Spectrum Inventory (Hall et al., 2007), were standardized (*z* scores; displayed point estimates are ± 1 *SD* from the mean). Error bars represent the standard errors for the point estimates. There was a significant externalizing by trial type by target emotion interaction. Offenders high on externalizing compared to those low on externalizing, controlling for level of psychopathy, were significantly less accurate on fear (* denotes $p < .05$), marginally less accurate on anger, and marginally more accurate on happy gaze-incongruent trials, but performed similarly on gaze-congruent trials.

psychopathy-related performance differences on gaze-incongruent trials. Thus, psychopathic offenders appear able to use emotion information when it is matches their set or necessary for their goal, but don't fully engage with that information when it is unessential for attaining their immediate goal (e.g., see Dadds et al., 2006 in children with psychopathic traits; Meffert et al., 2013; Newman et al., 2010 in adults with psychopathic traits). Just as this goal-directed focus facilitates performance in the current experimental context (i.e., less distracted by competing demands to process facial affect), this focus may also enhance the ability of psychopathic individuals to use charm and manipulation to get what they want, while leaving them unaffected by the potentially destructive consequences of their actions. This attention style may also explain how psychopathic individuals can use information that is directly relevant to their goal to effectively regulate behavior (e.g., modulate behavior to con someone), but display impulsive behavior (e.g., quitting one's job in the absence of an alternative one) and egregious decision making (e.g., seeking publicity for a con while wanted by police) when information escapes their awareness. Thus, results from the current study and the attention framework may help to explain the interpersonal callousness as well as the behavioral disinhibition commonly associated with psychopathy.

Although results are consistent with our predictions for psychopathy, it is difficult to rule out alternative explanations for these findings. Of particular relevance, some investigators have proposed that psychopathy is associated with shallow affect or other fundamental deficits in emotion processing (Blair & Mitchell, 2009; Patrick, 2007) that may impact the extent to which affectively salient information captures attention (see also Moul, Killcross & Dadds, 2012). A third possibility was recently suggested by Louise von Borries and colleagues (2012), who found that, relative to controls, psychopathic individuals could accurately identify affect while performing a facial affect identification task, but nevertheless failed to display to normal action tendency (i.e., avoidance) to angry faces. Consistent with the somatic marker hypothesis (Damasio, 1994), the difference reported by Louise von Borries et al. may suggest that psychopathic individuals are less likely to activate automated reactions in response to emotion-related cues including faces. With regard to the current findings, one could speculate that a deficiency in such automatic action tendencies reduced the effects of distracting affective expressions on nontarget trials while leaving the more deliberate processing of target faces relatively unaffected (see Table 2 correlations). Although all of these proposals may be relevant for explaining the present results, it should be noted that only the proposed attention-based explanation predicts the significant differential performance of psychopathic individuals on gaze-congruent versus gaze-incongruent trials and provides an explanation for the anomalous response in psychopathic individuals to attentional manipulations in diverse nonaffective contexts (Newman & Baskin-Sommers, 2011).

In contrast to psychopathic offenders, results for the externalizing dimension were somewhat mixed. As predicted, higher externalizing scores were specifically associated with weaker inhibitory control on gaze-incongruent trials (i.e., when participants were required to inhibit a dominant response after recognizing the target emotion expression). The differential importance of cognitive demands (e.g., inhibition, more complex task instructions) for externalizing-related disinhibition has been well-documented (Endres et al., 2011; Morgan & Lilienfeld, 2000). However, deficits in cognitive control alone could not account for the variability in accuracy based on affective subtype. That is, externalizing offenders displayed a specific deficit on trials that presented facial expressions involving fear or negatively valenced emotions com-

bined. Contrary to prediction, though, externalizing was positively associated with response accuracy (i.e., better inhibition) when the target expression involved a happy face.

Though the valence specificity of the apparent deficit in affective cognitive control was not predicted, this pattern is consistent with previous empirical work and clinical characterizations of externalizing individuals. For instance, the overallocation of cognitive resources toward affectively negative cues has been associated with an externalizing-related tendency to experience greater negative affect when failing to obtain an anticipated reward (Avila & Parcet, 2001; Yau et al., 2012), psychophysiological hyperreactivity in response to stressful or threatening events (Verona et al., 2002; Baskin-Sommers et al., 2012), heightened attentional engagement in images of others in distress during an emotional dot probe task (Kimonis, Frick, Cauffman, Goldweber, & Skeem, 2012), an inability to inhibit responses to angry but not happy faces (Denny & Siemer, 2012), difficulty resisting urges for substance use (Tiffany & Conklin, 2000), and aggressive behavior in reaction to insults and threats (Blair, 2001). Based on previous and the present results, it is possible that an externalizing-related difficulty balancing cognitive resources is related to particular affective sensitivities and actions to avoid the experience of negative affect (Frick & Morris, 2004). By contrast, in the presence of positively valenced faces (i.e., happy), offenders high compared with low on externalizing were moderately more accurate. Positive affect, especially as it relates to behavior, often is facilitative, partially because it is less likely to motivate a process to select particular action tendencies (Fredrickson & Branigan, 2005). Accordingly, the cognitive reaction to cues representing positive emotions among externalizing offenders may enhance their ability to engage in pleasure-seeking more wholeheartedly or display extraverted interpersonal tendencies (Ashby, Valentin, & Turken, 2002). This variability in reactivity depending on motivational content suggests that the presence or absence of cognitive control deficits depends on the specific affective context. Further research is needed to clarify the circumstances in which positive affect and other motivational cues (e.g., money, sex, drugs) cues engender self-destructive disinhibited behavior in externalizing individuals (Newman et al., 1993; Wallace & Newman, 1997).

Although the overall results provide good support for differentiating the cognitive-affective dysfunctions of psychopathic and externalizing offenders, this study is not without its limitations. First, because of theoretical relevance and task demands the present study used fear, anger, and happy affective expressions; however, some research indicates that other negative affective expressions, such as sadness, may be particularly important for some forms of disinhibited behavior (Marsh & Blair, 2008). An important avenue for future research may be to explore such differential effects. Related, a second concern is the between-subjects nature of the design, whereby each participant experienced only one target emotion during the task. Thus, it is unclear whether individuals would have reacted differently to different target types within the same task session. Despite this, there was no main effect of emotion type, suggesting that across the entire sample, performance did not differ when receiving a target of fear, anger, or happy content and there is no concern about carry-over effects as would be present with a within-subjects design. Third, with regard to the externalizing findings, the deficit in affective cognitive control was significant for fear faces, but only marginally significant with angry and happy faces. It is possible that this difference reflects the effects of task sensitivity, such that fear stimuli elicit a stronger interruption of approach behavior than anger stimuli (Adams, Gordon, Baird, Ambady, & Kleck, 2003). Given the newness of this task, it is important for future work to replicate and extend these findings. Lastly, the present study used condition manipulations and a behavioral metric to assess the putatively distinct cognitive-affective processes associated with psychopathy and externalizing. Additional measures of attention and cognitive control (e.g., different tasks, such as the dot probe or Stroop, psychophysiological measures of attention, such as EEG or imaging) may help disentangle and differentiate these processes further. Although more research is needed, the current study indicates that manipulating the primacy of emotion stimuli significantly alters the quality of processing in psychopathic and externalizing offenders, provides good support for the a priori theoretical models evaluated, and is consistent with other empirical findings.

The results of this study have both theoretical and applied significance for these classes of disinhibitory psychopathology. Broadly speaking, recognition and utilization of facial affect is theorized to play an essential role in socialization and interpersonal interactions (Blair, 2003; Knutson, 1996); therefore, any psychobiological processes that interrupt the fluency with which this information is processed may be important for understanding the underpinnings of disinhibition. With regard to psychopathy, these results using facial affect complement growing evidence showing that psychopathy-related deficits in emotion processing are context specific (Mitchell et al., 2006; Newman & Baskin-Sommers, 2011). As for externalizing, the pattern of anomalous cognitive functioning in the presence of affective faces is consistent with previous work using other motivationally significant information, and moreover the circumstances under which cognitive control may be affected is an interesting avenue for future work. Despite being phenotypically similar syndromes, it is important for future research to keep in mind the distinct multifaceted cognition-emotion interactions associated with psychopathy and externalizing, respectively (see Frick, 2012 for a similar proposal in children). Ultimately, a more specified understanding of these interactions may promote the development of more precise treatment and prevention programs targeting disinhibited behavior.

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