Affect Intensity and Perceptions of Arousal in a Subclinical Level of Psychopathy termed Aberrant Self-Promotion

by

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Abstract

The purpose of this study was to answer questions about affect intensity and self-perceived arousal differences in aberrant self-promoters (ASPs) and in individuals high and low in affect intensity (AI). Participants in the study completed a task asking them to respond as quickly and accurately as possible to letter strings presented for 200ms on a computer screen. They completed the task once with letter strings that formed words with an emotional valance and a second time with neutral-valence words. After each task, participants made self-reports of Energy and Tense dimensions of arousal as measured by the Activation-Deactivation Adjective Checklist. As first formulated, the study examined 4 groups of n = 30 (ASPs, non-ASP controls, high-AIs, and low-AIs). Results showed that, as hypothesized, ASPs scored significantly lower than high-AIs on the Affect Intensity Measure (AIM). Other hypotheses were not supported by analyses of the original four groups. However, because about 1/3 of the ASPs exhibited high AIM scores, ASPs were divided into primary and secondary types: (a) those who scored low and (b) those who scored high on the AIM. Subsequent post hoc analyses, based on the hypotheses that had not been supported initially, were conducted on five groups of n = 7. The study found that low-AI ASPs reported significantly lower arousability levels than high-AIs. Results also showed that controls, high-AIs, and low-AIs all reacted significantly more slowly to emotional words than to neutral words. Low-AI ASPs failed to demonstrate this response-time slowing, indicating that, like psychopaths, ASPs may process positive, negative, and neutral stimuli similarly. Additional results indicated that low-AI ASPs decreased both energetic and tension arousal levels after the emotional word task, compared to the neutral word task, whereas high-AIs reported corresponding increases in these types of arousal. These findings support Larsen and Diener's (1987) theory regarding arousal differences in high- and low-AIs. Implications of these findings are discussed in terms of a weak Behavioral Inhibition System (Gray, 1987).

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A group of individuals have recently been investigated who display the same pattern of personality characteristics as the psychopath, but in a less extreme form. These individuals have been labeled "aberrant self-promoters" (ASPs) (Gustafson & Ritzer, 1995) and are said to differ from the psychopath in a quantitative and not qualitative sense. ASPs are conceptualized as individuals who display a definable personality and behavioral pattern. They display the personality attributes that are central to the clinical level of psychopathy such as grandiosity, pathological lying, entitlement, superficial charm, need for dominance, lack of empathy, and lack of guilt. ASPs also lead an anti-social lifestyle and violate socially accepted norms, although their deviant behavior is not always defined as illegal. Therefore, further investigation into this subclinical form of psychopathy is a worthwhile endeavor. This less severe form of psychopathy is also more prevalent in the general population. Cleckley (1941; 1982) estimates that about two percent of the population can be classified as psychopathic, though Gustafson and Ritzer (1995) found the prevalence of aberrant self-promotion to be six and eleven percent in two separate samples. Therefore research findings on this group may uncover general principles of behavior that apply to more individuals than research on psychopaths.

To better understand the links between psychopathy and aberrant self-promotion, it is first necessary to outline, in broad terms, what is meant by the term "psychopath". Cleckley, in The Mask of Sanity (1941; 1982) considered psychopathy to be a cluster of 16 personality traits. These traits can, and often do, manifest themselves as antisocial behaviors. However, psychopaths may escape identification as antisocial if they are unusually intelligent or highly socialized. The converse is also true, in that, persons who exhibit a history of antisocial behaviors are not considered to be psychopaths if they do not posses the necessary personality traits. A core feature in Cleckley's definition of psychopathy is a lack of emotion (especially guilt, remorse, and empathy) or an inability to develop meaningful relationships with or feelings for others. However, on the surface, the psychopath appears charming and intelligent, with an absence of irrational thinking and nervousness.

Based on Cleckley's conceptualization of psychopathy, Hare (1980) attempted to create a reliable, valid, and generally accepted means of assessing psychopathy. He created the Revised Psychopathy Checklist (PCL-R) (Hare, 1991) which has proven its usefulness for assessment purposes in a number of different countries and cultures (Hare, 1993). According to Hare (1993), psychopathy is a syndrome (a cluster of related symptoms) which centers around two factors: an emotional/interpersonal factor and a socially deviant life-style factor. The emotionality factor involves a selfish, callous, and remorseless use of others. Emotional and interpersonal characteristics of the psychopath include superficiality, egocentricity, lack of remorse or guilt, lack of empathy, deceitfulness, manipulativeness, and shallow emotions. The psychopath also has a life-style that is characteristically impulsive and irresponsible. Psychopaths show poor behavioral controls, a need for excitement, early behavior problems, and adult antisocial behavior. A diagnosis of psychopathy would be based, not on isolated occurrences of the above symptoms, but on the observation of a pattern of symptoms from both the personality attributes factor and the deviant behavior factor.

Another issue to be addressed in the conceptualization of psychopathy is the separation of primary from secondary psychopaths. Primary psychopaths are said to be low on trait anxiety (as

measured by the Welsh Anxiety Scale, 1956) whereas secondary psychopaths are highly anxious and neurotic and do not show the typical passive avoidance deficits shown by true (primary) psychopaths (Newman, Widom, & Nathan, 1985). Some researchers have accepted this division of psychopaths into one group which shows very little anxiety, guilt, or empathy towards others and a second, neurotic group which shows excessive emotionality (Hare, 1970; Lewis, 1991). In accordance with Hare's (1993) conceptualization of the true psychopath as one who displays shallow emotions and an inability to imagine the emotionality of another person, the term "psychopath", in the current proposal, will be used exclusively to refer to the primary psychopath.

Aberrant Self-Promotion and Affect Intensity

Aberrant self-promotion will be used as a model for psychopathy in the current study. It is assumed that "the difference between the ASP and the psychopath is one of degree, not kind" (Gustafson & Ritzer, 1995). However, due to the recent establishment of this construct, the research on ASPs has been limited. To date, the existence of the ASP pattern has been established through comparisons of individual's targeted as ASPs through three distinct methods of classification: namely cluster analysis, factor analysis of persons, and factor analysis of items (Gustafson & Ritzer, 1995). It has also been shown that ASPs differ from non-ASPs on characteristics relevant to psychopathy. For instance, ASPs score significantly higher than non-ASPs on the Psychopathy Checklist-Revised although ASPs do not reach the criteria necessary for a diagnosis of psychopathy (Gustafson & Ritzer, 1995). In addition, ASPs have been found to have lower grade point averages, to self-report more illegal acts, and to receive more parking tickets than do non-ASPs (Gustafson & Ritzer, 1995). It has been shown that aberrant self-promotion is distinct from the Machiavellian personality type in a discriminant validity study (Holloway, 1995) as well as in terms of the behavior of ASPs and the calculating and manipulative behavior of the Machiavellian (Russell, 1996; Russell & Gustafson, 1997). One area previously neglected in ASP research is the extent to which the ASP is similar to the psychopath in terms of characteristics related to the emotional factor of psychopathy.

Therefore, the current research will examine the intensity of affect displayed in ASPs. Affect intensity is the typical strength of a person's emotional response, a response that is stable across time and consistent across situations (Larsen & Diener, 1987). In psychopaths, emotional deficits have been an area of considerable investigation although the exact nature and extent of this deficiency is not yet clearly understood (see Newman & Kosson, 1986; Patrick, Cuthbert, & Lang, 1994; Lang, Bradley, & Cuthbert, 1990; Williamson, Harpur, & Hare, 1991). However, affect intensity is a construct that has not been directly studied in ASPs. The results of this proposed investigation on the emotional intensity displayed by ASPs would be expected to generalize to a sample of clinically-defined psychopaths. Although such assumptions would have to be tested in future research, it is assumed that whatever findings are relevant to ASPs should be manifested even more strongly among psychopaths. The use of ASPs in the current study will not only contribute to the knowledge base concerning this type of individual and further establish its validity, but also, by using ASPs who represent a weaker version of the syndrome of psychopathy, a stronger argument will be made that true differences in terms of affect intensity exist between individuals of this type. Further, to the extent that personality characteristics such as lack of empathy, remorse, and guilt compel an individual to commit deviant, anti-social activities, studying a group of individuals who display these characteristics would ultimately contribute to the understanding of the causes of crime and anti-social behavior

when it is performed with very little emotion. Thus, the current study is designed to investigate ASPs with regard to their affect intensity in order to gain insight into the motives that underlie their anti-social behavior.

To further underscore the need for examining affect intensity in this psychopathy-like cluster of individuals, the research on the emotionality in the psychopath will be briefly addressed. It is assumed that ASPs would behave similarly, but less extremely, than psychopaths on these dimensions.

Psychopathy and Emotions

Emotionality in the psychopath has been extensively researched, although the precise characteristics of the psychopath's deficiency have not been entirely defined. Cleckley (1941, 1982) believed that the semantic and behavioral components of emotions are not connected in the psychopath. For instance, although psychopaths often verbalize remorse over their crimes, it appears that their motive is to get out of an institution or jail sentence. If they are urged to clarify why they blame themselves, their insincerity and their true motive, which is to obtain trust and confidence from others, is revealed (Hare, 1993). It is Cleckley's (1941, 1982) hypothesis that psychopaths are semantically disordered so that they lack the ability to understand what emotional experiences in life mean to others; instead they imitate the activities and expressions of people who have normally integrated emotions and feel the consequences of their experiences. Hare (1993) describes psychopaths as having only "proto-emotions": primitive responses to immediate needs. He notes that the known psychopath, Jack Abbott, once said that he could imagine feeling the emotions he reads about, but he himself could never feel them.

Some investigators have concluded that psychopaths are poor at passive avoidance learning. In other words, they show deficits in learning to inhibit behaviors that lead to punishment (Newman & Kosson, 1986). The cause of this deficit, although uncertain, may be that psychopaths are deficient in developing conditioned fear responses (Fowles, 1980; Hare, 1978). The research in this area is based on the assumption that, for most people, fear of negative consequences provides a strong motivation not to behave in certain ways. However, it has been shown that fear is largely cognitive in nature for the psychopath. In other words, they report fear when faced with potentially threatening events, but lack the physiological responding normally associated with such feelings. For example, a pattern of low electrodermal arousal combined with an increase in heart rate is seen in psychopathic inmates when there is a threat of an aversive event such as electric shock (Hare, 1978) or an aversive tone (Hare, Frazelle, & Cox, 1978). The results of these studies have been interpreted in light of evidence that increased heart rate is indicative of a defensive response which covaries with a decreased sensitivity to the environment, a decrease in cortical arousal, and "sensory-rejection" (Lacey, 1967). Hare et al. propose that this pattern of physiological activity may reflect an efficient coping mechanism in the psychopath; one which reduces the salience of anticipated aversive events.

Research on the emotional deficits in the psychopath has been extended by the work of Patrick, Cuthbert, and Lang (1994). They propose that psychopaths have an emotional imagery deficit whereby the association between the emotional semantic and response elements in memory are weak or absent. This idea is based largely upon Lang's bioinformational theory of emotional imagery (Lang, 1979), which is a tri-partite model of emotional responding that represents emotional reactions as composed of three systems: subjective experience, overt behavior, and physiological reactions. According to Lang's theory, in normal individuals, image processing activates the memory network; thus elements of an emotional network (i.e. fearful

events) activate, through associations, relevant response elements (i.e. the body's physiological responses, overt behaviors, or subjective experiences). Therefore, Patrick et al. hypothesized that psychopaths would show smaller physiological response differences when processing fearful as opposed to neutral sentences, compared to nonpsychopaths. They also hypothesized that the self-report of the emotional response would not differ between psychopaths and nonpsychopaths. This study used the physiological measures of heart rate, skin conductance, and corrugator EMG. The results supported the hypotheses: Psychopathic subjects showed smaller physiological response changes from fear imaging to neutral imaging as compared to nonpsychopaths. However, the groups did not differ in their self-reports, and both rated the fearful images lower in pleasantness, higher in arousal, lower in dominance, and equal in vividness. This finding suggests to the authors that psychopaths are deficient in forming associations between language cues and the resulting emotion. The findings suggest an affective imagery deficit in psychopaths which may lead them to fail to consider negative consequences of their actions. However, their nonaffective memory associations seem to be intact because the subjects in this study retained their ability to make self-reports of their emotional experience that did not differ from those of nonpsychopaths. The results of the study support Cleckley's hypothesis that psychopaths possess a semantic deficit such that language processes are intact but dissociated from emotions (1941, 1982). The study's results are consistent with the idea that psychopaths process language differently than do non-psychopaths. Hare and McPherson (1984) found that psychopaths have less of a right-ear advantage when processing words. This indicates that they are less lateralized and are more symmetrical for language than are non-psychopaths.

Studies using different stimuli to elicit affect also have found evidence that psychopaths process emotional stimuli in a manner unlike non-psychopaths. For example, it has been shown that psychopaths do not show the affect-startle effect (Lang, Bradley, & Cuthbert, 1990). This effect is demonstrated in normal subjects when the reflex eyeblink response increases following an intense, unanticipated acoustic signal as the unpleasantness of the image in slides increases. In other words, startle magnitudes are greatest while viewing unpleasant slides and smallest during pleasant slides in normal college students. Patrick, Bradley, and Lang (1993) studied this effect in psychopaths and discovered that the linear trend for affective valence was found only among non-psychopathic groups and groups containing a heterogeneous sample of criminals. The startle responses for the group of psychopaths did not differ between pleasant and unpleasant slides. Moreover, the psychopaths' responses to pleasant and unpleasant slides were significantly smaller than their startles to the neutral slides. No differences in the self-report responses to the slides were found between groups. The authors suggested that these results indicate either a fear deficit (when aversive cues fail to evoke defensive actions normally associated with such cues) or a tendency for psychopaths to interpret both pleasant and unpleasant stimuli in terms of approach responses.

Psychopathy has also been shown to have an effect on memory for emotional events. Christianson, et al. (1996) examined recall for peripheral and central details of emotional and neutral slides among psychopaths and nonpsychopaths. Similar to results found for adults and children in previous studies, nonpsychopaths in the current study recalled the central details of the negative emotional slides better than the peripheral details (i.e. the color of the coat of the person injured versus the color of the car in the background). However, the psychopaths recalled the central and peripheral details equally well in both the neutral and emotional slides. As found in previous studies, the self-reported affect induced by the slides did not differ between the

groups. This study replicates the same general finding that psychopaths are able to use language normally to describe emotional situations but they experience emotional events differently than normal individuals. In other words, they are unable to appreciate or use affective words or stimuli to induce typical emotional reactions in themselves.

Based on the idea that psychopaths do not make efficient use of affective linguistic cues, Williamson, Harpur, and Hare (1991) tested psychopaths for their processing of verbal material. They recorded reaction time (RT) and event-related potentials (ERPs) while psychopaths and nonpsychopaths responded "yes" or "no" to the question "Is it a word or not?" when a list of affective, neutral, and nonpronounceable nonwords were presented individually on a computer screen. They found that among nonpsychopaths, RTs were faster and ERPs were larger (the sustained positivity was widely distributed over the scalp) to the affective words than to neutral words. The psychopaths, on the other hand, failed to exhibit such differences between the affective and the neutral words, suggesting that they extract less information from affective words than do normal individuals.

To date, research on the emotional deficits in psychopaths has concentrated mainly on emotional memory, emotional imagery, and fear responses to emotional stimuli. Researchers have attempted to discover whether the psychopath is better understood as having a generalized emotional deficit or one that is specific to certain emotions. Some researchers have focused on studying the deficits to positive versus negative emotions, whereas others have specifically investigated the emotions of guilt, fear, empathy, anger, happiness, or sadness (Blair et al., 1995). As yet, it is unclear whether psychopaths have a generalized emotional deficiency, a deficiency with respect to all negative emotions, or a deficiency with respect to only certain negative emotions. It is also unclear whether the deficit would better be understood as an expressive disorder or as an emotional perception disorder.

Given the fact that one of the 22 items on the Psychopathy Checklist Revised (PCL-R; Hare, 1991) is labeled "Shallow Affect" and refers to the psychopath's inability to experience a normal range and depth of emotion, affect intensity in psychopaths seems to be a critical dimension to explore directly. The psychopath is often described in clinical interviews as cold and unemotional (Hare, 1993). Although they may show dramatic displays of emotions, they are generally short-lived and lack depth. The psychopath often gives the impression to clinicians that he or she is only pretending to feel emotions, but that emotions are really only superficial. For instance, psychopaths are often unable to differentiate between emotions with subtle differences. According to Hare (1991), the psychopath may "equate love with sexual arousal, sadness, with frustration, and anger with irritability (p.31). When researchers are being trained to score interviews with psychopaths according to the PCL-R, they are instructed to ascertain inconsistencies between the verbal report of emotion given by the interviewee and their actual behavior. For instance, the interviewee may state their love for a sick friend, but then be unable to provide information about the friend's specific condition or whereabouts (Hare, 1991). Day and Wong (1996) examined this issue and found evidence for a trait of shallow affect in psychopaths. This study found that psychopaths scored significantly lower than did nonpsychopaths on the Affect Intensity Measure ($t(1, 38) = 2.45$, $p < .05$). Based on this information and on the classic clinical descriptions given by Cleckley (1941; 1982) and Hare (1993), the current study predicts that if ASPs are similar to primary psychopaths, ASPs will also be lower in affect intensity than non-ASPs across all emotions.

Affect Intensity

It is interesting that in discussions concerning the factors involved in emotional responding, the intensity of the experience has rarely been addressed directly. As an exception, Clore (1994) and colleagues have tried to identify the factors that affect the intensity of the emotional response. Their perspective maintains that the intensity of an emotion is influenced by an individual's appraisal of the emotion-inducing situation, relative to his or her goals, standards, and attitudes. This definition of intensity is based on a combination of the duration and the amplitude of the reaction. Although some previous research has focused on the issue of emotional intensity, the work has generally been concerned with identifying the physiological and personality correlates of the intensity of single emotional episodes within individuals.

In contrast, the concept of the intensity of emotional experiences in terms of a stable, individual difference characteristic is a topic which has received more attention in the recent research on emotions. Affect intensity (AI) has been defined as the typical strength of a person's emotional responsiveness (Larsen & Diener, 1987). Although AI levels may differ among individuals, its level within an individual reflects a stable style of emotional responding across time and situations. Common sense would suggest that the intensity of an emotional response would increase as the magnitude of the emotion-invoking stimulus increases. However, it has been shown that individuals high on AI show stronger emotional responses than those low on AI to the same stimulus, regardless of the emotion being provoked (Larsen & Diener, 1985). In the current study, it will be assumed that individuals who are low in AI generally experience emotions shallowly. This construct is independent from the stability of emotional experiences or the degree to which a person mood swings and variability in their emotional responses.

The topic of affect intensity generated increased interest when Diener, Larsen, Levine, and Emmons (1985) proposed that a distinction should be made between the frequency of positive and negative affect and the intensity of affect. This distinction was made in order to account for discrepant findings in the literature. For instance, some studies had found that negative and positive affect were strongly and negatively related (see Wessman & Ricks, 1966; Watson & Tellegan, 1985), whereas others had demonstrated positive and negative affect to be independent across time and persons (see Bradburn, 1969). Diener et al. (1985) proposed that to understand how emotions are experienced over time, the frequency dimension and the intensity dimension must be studied separately. Specifically, they proposed that the frequency with which one experiences positive and negative emotions is distinct from the intensity with which one feels an emotion; a distinction which was not made in the earlier studies.

Based on this distinction, Diener et al. (1985) concluded that a person who feels strong negative emotions may also feel strong positive emotions regardless of how often these emotions are experienced. Three studies were conducted in which participants completed daily mood forms to determine the frequency and intensity of their emotions. It was determined that the correlation between positive and negative emotions, in terms of intensity, was .70 across all three studies. Moreover, correlations based on intensity were even stronger for moods assessed at random moments ($r = .88$) and for moods assessed immediately after a very strong emotion was experienced ($r = .80$). However, with intensity factored out, the correlation between the frequency of positive and the frequency of negative affect was negative (-.46, -.76, and -.86 for studies 1, 2, and 3 respectively). These negative correlations suggest that when a person experiences positive emotions more frequently, less time is available, over a given interval, for them to feel negative emotions. Based on these findings, the authors concluded that affect intensity is a meaningful and reliable dimension of personality.

The convergent and discriminant validities of affect intensity with other constructs have been assessed to establish further that affect intensity is an important and independent dimension of emotional responding. Larsen and Diener (1985) used a multitrait-multimethod approach to establish the validity of this construct. They assessed hedonic level (the individual's degree of or frequency of positive vs. negative affect defined as the ratio of 'good' to 'bad' days computed from daily mood reports) and affect intensity by using three methods: a one-time self-report measure, a value calculated from daily mood reports taken over a 12 week period, and reports taken from parents of the participants. Although the measures used in this study were all subjective reports of mood, the authors maintain that they are actually quite different. For instance, although the one-time self-report measure was identical to the instrument completed by the parents of the participants, parents must rely on outward displays to infer affect intensity in their child because parents do not have direct access to their child's feelings. The daily mood measures were in a completely different format from the one time self-report measures. Participants were asked to indicate how much they felt various emotions each day for 84 days on a 6-point rating scale. Results showed high correlations across methods, within the constructs of hedonic level and intensity. In contrast, the heterotrait-monomethod correlations were low and nonsignificant. These findings indicate that affect intensity is not a by-product of the method used in its assessment. Heterotrait-heteromethod correlations were also low and nonsignificant, suggesting that hedonic level and affect intensity are independent constructs.

A considerable amount of research has been devoted to the topic of affect intensity. For instance, it has been shown that affect intensity is related to certain personality characteristics. Specifically, low scores on the Affect Intensity Measure (AIM; Larsen, 1984) correlate positively with compulsive-conforming personality, and high AIM scores correlate positively with passive-aggressive and borderline characteristics (Flett & Hewitt, 1995).

Cognitive processes in individuals high and low in AI have also been examined. Because individuals high in AI respond more intensely than do individuals low in AI to identical stimuli, it was thought that high-AI individuals may cognitively interpret the stimuli in a different manner. Larsen, Diener, and Cropanzo (1987) asked participants to view a series of slides depicting pleasant and unpleasant scenes and then answer items on questionnaires designed to uncover cognitive operations used during the viewing time. Results showed that, compared to participants who scored low in AI, participants high on AI engaged in more personalization (i.e., they interpreted the positive and negative information in the slides in terms of themselves), more overgeneralizations (i.e., they construed the events in terms of how much good or evil there is in the world), and more selective abstraction techniques (i.e., they focused their attention on a specific positive or negative aspect of the slide). In contrast, the low-AI group reported thinking about the purpose of the study rather than about a specific component of the slide. In the second part of this investigation, Larsen et al. sampled the thoughts of individuals midway through the slides in an "on-line" manner. Results showed that high-AI individuals were more likely to focus their attention on the emotional components of the slide. These individuals also thought about the actual content of the slides during the induction and overgeneralized from the content more so than individuals low in AI. The authors interpret these results in terms of the effects of cognitive processes on emotion regulation and the effects of cognitive attributions on the intensity of emotional reactions. It is thought that differences in the way a person interprets emotional stimuli may effect the intensity of the affective response. Specifically, the authors speculate that high-AI individuals may have low baseline arousal levels which causes them to use

cognitive operations designed to amplify the intensity of their emotional reactions due to the desire to raise their arousal levels to an optimal level (Larsen et al.).

This study was replicated with a sample of middle-aged British women. It was found that those high in AI, compared to those low in AI, engaged in more personalization to the positive and neutral slides and used more global thinking in the negative and neutral slide conditions (Dritschel & Teasdale, 1991). The findings demonstrated that individuals high in AI show not only distortions in cognitive processing to emotional stimuli regardless of its valence (see Larsen et al., 1987), but they show cognitive distortions to neutral stimuli as well. In addition, high scores on measures of extroversion were not associated with the cognitive operations studied, although a statistically significant correlation between neuroticism and measures of cognitive operations was observed. To explain this result, the authors maintained that both neuroticism and affect intensity may be cognitively mediated, whereas, extroverts may require actual stimulation seeking or social behaviors to provoke an emotional response.

Another explanation of individual differences in affect intensity is that individuals may learn different emotional control strategies which account for their differences in affect intensity. For example, because social norms dictate how and when emotions can be expressed, people may adopt different mechanisms for regulating their emotional expression. Flett, Blankstein, Bator, and Pliner (1989) tested this hypothesis by asking participants to complete the Social Skills Inventory (SSI; Riggio, 1986), which has several subscales. Results showed affect intensity to be negatively correlated with self-perceived emotional control. However, AIM scores were not significantly correlated with generalized self-control, physiological self-control, or social control. Although not related to social control, affect intensity was positively correlated with emotional expressivity, emotional sensitivity, social expressivity, and social sensitivity. These results indicate that affect intensity is positively associated with greater social skills and with the ability to decipher emotional information from stimuli.

The current research will investigate affect intensity levels in ASPs. Although research indicates that psychopaths may suffer from a fear deficit (Fowles, 1980; Hare, 1978), that their emotional responses may not be adequately linked to emotional stimuli (Patrick, Cuthbert, & Lang, 1994), that they may process emotional stimuli differently from nonpsychopaths (Lang, Bradley, & Cuthbert, 1990; Williamson, Harpur, & Hare, 1991), and that they are lower in affect intensity then nonpsychopaths (Day & Wong, 1996), as yet, no study has directly examined the characteristic of shallow affect in ASPs. This study will address this issue by examining group differences on the Affect Intensity Measure (Larsen, 1984) in terms of aberrant self-promotion. It is proposed that ASPs will score significantly lower on this measure of the stable trait of affect intensity than non-ASPs who are high in AI.

Inconsistencies in the Underarousal Theories of Affect Intensity and Psychopathy

A second objective of the proposed research is to investigate the inconsistencies in the underarousal theories of psychopathy and affect intensity using ASPs as a model for psychopathy. The theories are inconsistent in that although Larsen and Diener (1987) contend that individuals high in affect intensity will show low levels of baseline arousal, Hare (1982; 1993) suggests that psychopaths exhibit low levels of both baseline arousal and emotional responding. It will be shown that the type of arousal considered by both Larsen and Diener (1987) and by Hare (1982; 1993) is not clearly defined according to current research on the construct of arousal. Specifically, the studies examining affect intensity and psychopathy have not conceived of arousal as a multifaceted construct or consistently accounted for instances of

directional fractionation (Lacey, 1967), whereby arousal would appear to be at different levels, depending on the system in which it is measured. If no single system reflects general arousal, it may be more useful to discuss these issues in terms of a specific type of arousal. This study will attempt to clarify this issue by examining one aspect of arousal: the individual's self-perceived arousal levels. Future research will be necessary to discover relationships between psychopathy, affect intensity, and other types of arousal such as cortical or autonomic types.

The Transformation of Arousal Theories

Historically, arousal was conceived of as a general state. Arousal was thought to be reflected globally in the form of increased activity in a number of physiological events such as heart rate, blood pressure, skin conductance, and EEG desynchronization (Duffy, 1972; Malmo, 1959). General arousal theory was supported by research showing that several physiological variables can change in the same direction as activation levels increase (Eason & Dudley, 1971; Maclean, Ohman, & Lader, 1975).

According to general arousal theory, arousal forms a unidimensional continuum ranging from low to high. The relationship between arousal and performance is thought to be a U-shaped function, such that as arousal increases, performance also increases until an optimal point of arousal is reached. When a critical level of arousal is exceeded, performance will gradually deteriorate (Malmo, 1959). The U-shaped relationship between arousal and performance is often called the Yerkes-Dodson Law (Yerkes & Dodson, 1908).

The ascending reticular activating system (ARAS) is frequently implicated in discussions of the physiological correlates of arousal. According to Malmo (1962), the ARAS, which projects both into and out of the cerebral cortex, plays an important role in regulating both arousal and performance by facilitating impulses arriving at the cortex. As arousal increases across the continuum, the amount of cortical bombardment by the ARAS also increases. Research has shown that lesioning the ARAS will eradicate certain patterns of EEG activation and result in behavioral lethargy and drowsiness (Lindsley, 1956). As a whole, this research supports the importance of the ARAS in maintaining cortical arousal and wakefulness.

General arousal theory has been heavily criticized, however. Ax's (1953) seminal study, for example, examined physiological responses during feelings of fear and anger and observed that the two emotions could be differentiated based on their patterns of electrodermal responses (EDR), diastolic blood pressure (BP), and heart rate (HR). This study contradicted general arousal theory by demonstrating that the physiological activation associated with emotional states could differ. Previously it was thought that the experience of an emotion coincided with a generalized state of arousal that energized the body and prepared it for possible behavioral adaptations (Cannon, 1929). In other words, general arousal theory would predict an increase in the activity in all aspects of the ANS, CNS, and behavioral responses when emotions are experienced due to the increase in arousal.

Lacey (1959; 1967) has offered an alternative model to traditional arousal theory by suggesting that autonomic, central, and behavioral activation are distinct types of activation. Lacey views the failure to consider different physiological response patterning as a weakness in arousal theories. The basic premise of his concept of "directional fractionation" is that the autonomic nervous system (ANS) does not act as a whole in the sense that all of the structures of the system are activated in the same direction. Rather, fractionation is said to occur when one or more physiological functions changes in a direction opposite to what would be predicted by general arousal theory. For example, Lacey, Kagan, Lacey, and Moss (1963) exposed subjects to

situations requiring only observation of the environment (i.e., looking at a flashing light) or conditions involving internal processing such as cognitive elaboration (i.e., solving a mental math problem). They found that the sensory intake situation produced a pattern of cardiac deceleration and a blockage of systolic blood pressure increase. The mental situations, however, produced the expected large increases in heart rate and blood pressure, a pattern that would be predicted by general arousal theory. The results were interpreted as evidence for the fractionation of physiological responses and the potential dissociation of the mechanisms that mediate them. Instances of directional fractionation have also been shown in response to IQ tests, cold pressor tests (Wilson, Albright, Steiner, & Andreassi, 1991), and in individuals asked to rate the unpleasantness of slides of homicide victims (Hare, 1972).

Cohen (1993) states that, originally, general arousal was thought to be analogous to behavioral states. It was thought that the behavioral manifestations of arousal fell along a continuum ranging from a coma and behavioral lethargy (low arousal) at one end to states of mania or agitation (high arousal) at the other. The findings that physiological activation does not always exist along this same continuum is a problem for general arousal theory. As evidence, Cohen cites research finding that although the stimulant Ritalin increases brain activation, it decreases hyperactive behavior in children. General arousal theory also has difficulty explaining how certain areas of the brain can remain quite active when a person is asleep and inactive behaviorally. It has also been shown that although low-frequency EEG is usually indicative of an awake state, this pattern has been found in coma patients. This research which demonstrates the dissociation between ANS, CNS, and behavioral activity indicate that arousal may be more specific than originally thought.

Although the construct of arousal has been used to explain many psychological phenomenon such as emotion (Schacter & Singer, 1962; Davidson, 1992, 1994; Cacioppo, Klein, & Bernston, 1993), introversion/extroversion (Geen, 1983; Eysenck, & Eysenck, 1964), interpersonal attraction (Zillman, 1984), criminality (Raine, Venables, & Williams, 1990), and many others, one agreed upon definition of arousal is lacking. Some investigators have focused on the activation of various aspects of the ANS (Cannon, 1927; Eysenck, 1977), while others have focused on behavioral or cognitive consequences (Zillman, 1983) as indices of arousal. Although arousal is extensively discussed in psychology, definitions vary widely from one research program to the next so that other researchers must infer the definition intended based on how the dependent variable(s) was measured. Nevertheless, the construct is pervasive throughout psychological literature and resistant to extinction.

According to Cacioppo, Bernston, and Crites (1996), studies based on arousal all assume that "arousal is a general and initially perceptible energizing physiological state that is the prepotent physiological determinant of social behavior (p. 72)." The current investigation will assume that research involving affect intensity and psychopathy have been theoretically grounded in such a definition of arousal. In other words, arousal is thought of as the primary motivation factor in emotional responding (in the case of affect intensity) and behavioral responding in the form of impulsivity and stimulation seeking (in the case of psychopathy). Theories of affect intensity and psychopathy commonly assume that individuals are differentially motivated to regulate their arousal levels.

Although the term arousal has been used in an overinclusive manner in the past and lacks specificity (Cohen, 1993), the term may still be useful if it is employed more selectively. The term retains a descriptive value in that most individuals will agree that changes in the body's

physiological responses often coincide with emotional responses and behavior. Because most individuals concede that a person who is experiencing an emotion such as fear or a person who is running a race is more aroused than a person who is not afraid or is lying down, the term maintains usefulness in a descriptive sense. According to Cohen, the term arousal should not be rejected but should instead be more carefully defined.

To clarify the inconsistencies between theories of affect intensity and psychopathy, the evidence regarding arousal levels and these constructs will be briefly reviewed in turn. These findings will then be integrated with current theory regarding the arousal concept to provide the rationale for the use of self-reported arousal levels in the current research.

Psychopathy and Arousal

Hare (1993) believes psychopaths may suffer from a generalized cortical underarousal deficit. He states that due to this deficit, the psychopath may miss or be unaware of environmental or social cues to guide behavior. Hare's theory is based upon Eysenck's (1967, 1977) line of reasoning. Specifically, Eysenck proposed the existence of two major dimensions of personality: introversion-extroversion and neuroticism. An individual's placement on these two dimensions reflects his or her tonic level of physiological activity or arousal. It appears that Eysenck conceptualizes arousal in the general sense in that he measures arousal at the ANS, CNS, and behavioral activity levels with no qualifications about types of arousal.

According to the theory, individuals differ in the "idling speed" of their arousal (Eysenck). For instance, when the ascending reticular activating system (ARAS) mediates neural input to the cortex while participants are resting in a sound-proofed laboratory, extroverts have a low idling speed (poor arousal as evidenced from slow, high amplitude waves in EEG data) and introverts have a high idling speed (high arousal; fast, low amplitude waves). According to Eysenck's theory, because introverts have higher levels of ARAS activity than extroverts, they should show greater responsiveness on measures of autonomic activity that are modulated by the ARAS. Baseline measures also show that introverts have larger eye pupils than do extroverts, indicating their higher levels of arousal (Eysenck, 1977). This biological difference is presumably the reason that extroverts are more likely than introverts to engage in stimulation seeking and/or delinquent behaviors.

Eysenck proposed that, compared to introverts, extroverts, with their lower arousal, would need more stimulation at greater intensities to maintain their arousal at an optimal level and thus would be more likely than introverts to engage in stimulation seeking behaviors which may include delinquent acts. In support of the theory, it has been shown that introverts learn conditioned responses more readily than extroverts do, but introverts perform worse when a very strong stimulus is used (presumably their learning is impeded because their arousal has risen above their optimal point) (Eysenck, 1977). Consistent with this view, in the process of classical conditioning, introverts, compared to extroverts, would more readily learn prosocial conduct when it is reinforced and more readily learn to avoid antisocial conduct when it is punished (Eysenck, 1977). Eysenck concluded that there is a positive and causal relationship between extroversion and criminality.

Eysenck's theory has been tested and supported by a number of studies. For example, Geen (1984) tested individuals on a paired-associate learning task and found that in the presence of low levels of background noise, introverts performed better than extroverts; conversely, at high levels of noise, extroverts performed better than introverts. Research has demonstrated that introverts are more arousable (meaning that their arousal levels increase more quickly and with

less intense stimulation) than extroverts (Stelmack, 1990). Introverts show higher skin conductance levels during arousing conditions (Smith, Rockwell-Tischer, & Davidson, 1986) and higher heart rate reactivity to stimuli (Pearson & Freeman, 1991) than do extroverts.

In contrast to these findings, many studies have failed to support Eysenck's theory. For example, Davis and Cowles (1988) failed to find differences in skin conductance levels between groups of introverts and extroverts. It has also been shown that the introversion-extroversion dimension does not predict the effects of caffeine (given to induce general arousal) on intellectual performance (Revelle, Humphreys, Simon, & Gilliland, 1980). After reviewing the literature on this topic, Gale (1981) concluded that there are no group differences between introverts and extroverts in terms of basal arousal levels. Instead, it seems that, at the group level, the personality types can only be distinguished in terms of differences in physiological responses to stimulation.

Hare (1993) uses Eysenck's explanation to account for psychopaths' active search for situations with exciting qualities. According to Hare's underarousal explanation of psychopathy, psychopaths may have an inhibitory defense mechanism that controls or blocks the input of information indicating that behavior will have negative consequences. Hare (1970) states that psychopaths have higher thresholds for cortical excitability. Therefore, psychopaths are characterized by a chronic need for stimulation in order to reach their optimal level of cortical arousal.

To date, it is still unclear as to whether or not psychopaths can be conceptualized as individuals who are underaroused at baseline. Josef, Lycaki, and Chayasirisobhon (1985) examined recorded brainstem auditory evoked potentials to auditory click stimuli and found evidence that antisocials are underaroused in the lower brainstem area, particularly in the ponto-medullary region of the brainstem. However, they noted that the EEG abnormality had disappeared by the time the information reached the rostral brainstem area. This underarousal is said to presumably be the result of the psychopaths' extreme levels of filtering incoming auditory stimulation which may lead to a stimulus deprivation state and subsequent sensation-seeking behavior (Raine, 1989). However, it should be noted that this study used a group of individuals classified as antisocial. Because such a classification may include individuals who are antisocial but not psychopathic (Lilienfeld, 1994), it is not clear at this point how these results would generalize to a sample of true psychopaths.

A problem with interpreting the above mentioned research on introverts/extroverts, psychopaths, and criminals is the lack of a precise definition of arousal. Hare (1993) appears to use the term to refer to CNS activity but then relies on research involving introverts/extroverts which have typically measured ANS activity and/or behavioral acts as evidence of cortical underarousal. As mentioned previously, this demonstrates an overinclusive use of the term arousal.

Other investigations have found evidence that psychopaths may indeed be underaroused if arousal, as Lacey (1967) suggested, is not conceptualized as a single dimension that is the foundation of all behavior. It has been proposed that there are three basic arousal systems in the brain: the behavioral activation system (BAS), the behavioral inhibition system (BIS), and the nonspecific arousal system (NAS) (Gray, 1977, 1982). According to Fowles (1988), psychopaths have a weak BIS. The BIS is conceived of as an anxiety system and is indexed by electrodermal activity. An efficient BIS acts to activate the NAS in the presence of punishers and omissions of rewards, thereby inhibiting dominant behaviors and focusing attention on relevant

stimuli. Due to their inefficient BIS, psychopaths detect punishment cues less readily than do normals; moreover, when these cues are detected, they cause less arousal and less behavioral inhibition. This model accounts for much of the literature on psychopaths, which finds that, compared to non-psychopaths, they show less fear arousal, are more responsive to reward than punishment cues, and show less inhibition of the dominant response when punishments cues are used (Newman & Wallace, 1993).

Although psychopaths have been described as low-aroused individuals who engage in stimulation seeking behaviors (Hare, 1993; Raine & Venables, 1984; Quay, 1965), Hare and Cox, (1978) found that the correlations between psychopathy and extroversion were small and mainly attributable to the antisocial lifestyle factor of psychopathy. Harpur, Hare, and Hakstian (1989) also found low and nonsignificant correlations between psychopathy and extroversion, based on individuals' responses to the Eysenck Personality Questionnaire (EPQ). Correlations were .08 and .10 for Factor 1 and Factor 2 of the Psychopathy Checklist (PCL), respectively, indicating that psychopathy cannot be equated with extroversion. Furthermore, to the extent that extroversion is related to low baseline levels of physiological and cortical arousal, these results imply that psychopaths are not characterized by low levels of such arousal.

To further understand this arousal issue, investigators have examined psychopaths' cognitive abilities to amplify or reduce the intensity of external stimuli. Raine and Venables (1990) addressed this question by using a psychophysiological variable related to sensation-seeking: the cortical augmenting-reducing paradigm developed by Buchsbaum (1975). From this perspective, augmenters are defined as individuals whose event-related potentials (ERPs) increase as the intensity of stimuli presented visually increases. The converse is also true: Reducers are those whose ERPs decrease or remain stable under these conditions. The study by Raine and Venables failed to show differences between high and low psychopathy groups in terms of ERP amplitudes, thereby indicating that psychopaths are not sensation-seekers, as sensation-seeking is conceptualized by the augmenting-reducing paradigm. In other words, their responses cannot be explained by positing a CNS mechanism that either reduces or augments sensory input. These results also support the inference that the psychopath does not suffer from a cortical underarousal deficit.

More evidence supports the role of cortical and autonomic underarousal among anti-social individuals than among the smaller population of psychopaths. For instance, research on skin conductance supports the idea that antisocial individuals are underaroused (Buikhuisen, Bontekoe, Plas-Korenhoff, & Buuren, 1985). Further evidence from EEG studies has demonstrated that criminals may be underaroused (Mednick, Volovka, Gabreieeli, & Itil, 1982). This abnormality takes the form of excessive slow-wave activity, which has been interpreted as an index of low arousal. Raine, Venables, and Williams (1990) studied the relationship between criminality and underarousal and found support for the idea that CNS and ANS underarousal are involved in criminality.

Recent research has been conducted on what has become known as the interference hypothesis of psychopathy (Kosson, Smith, & Newman, 1990; Kosson & Newman, 1986). This states that because psychopaths focus a great deal of attention on stimuli that have immediate significance to them, they fail to respond appropriately to subsequently occurring important events. Kosson and Newman (1986) have found evidence that contradicts this hypothesis. Instead, support has been found for the idea that psychopaths have poor abilities to shift attention in dual target tasks that require the participant to allocate resources to process a target and then

quickly reallocate resources to process another target. Kosson (1996) finds that this shifting attention deficit occurs specifically in situations that require left hemisphere processing resources. This research supports the idea that because psychopaths may be underaroused in the left hemisphere only, they are less efficient at tasks requiring left-hemisphere processing skills.

There is some evidence to suggest that the left hemisphere in psychopaths is not as specialized for processing verbal material as it is in nonpsychopaths. Hare and McPherson (1984) tested individuals in a verbal dichotic listening task. Words were presented simultaneously in both ears and afterwards, the participant was asked to recall all the words he or she could. The psychopathic group showed a significantly smaller right ear advantage than did nonpsychopaths, a finding that demonstrates the less lateralized performance in this group. Hare and McPherson state that the results indicate either low left-hemisphere arousal or poor organization for language in psychopaths. If this is true, they argue, language should play only a small role in the regulation of their behavior.

This finding was replicated in a group of juvenile offenders aged 13 to 18 (Raine, O'Brian, Smiley, Scerbo, & Chan, 1990). Raine et al. interpret their results, not in terms of low left-hemisphere arousal, but in terms of the role of language cues in the regulation of behaviors in psychopaths. They assert that psychopaths may be less apt to engage in cognitive operations or behaviors that rely on sequential processing controlled by the left hemisphere.

Day and Wong (1996) examined the lateral processing of emotional words in psychopaths, using a bilateral tachistoscopic presentation of words. Based on evidence that the right hemisphere is dominant in processing highly emotional words (Brody, Goodman, Halm, Krinzman, & Sebrechts, 1987; Borod, Andelman, Obler, Tweedy, & Welkowitz, 1992) and evidence of the shallow emotions displayed by psychopaths, it was predicted that psychopaths would rely less on right hemisphere functioning to decode emotional words than would nonpsychoapths. As predicted, nonpsychopaths reacted faster to emotional words presented in the left visual field (right hemisphere) than in the right. However, psychopaths did not show this right hemisphere advantage for processing emotional words. This study demonstrated that psychopaths also show less lateralized performance on tasks where normal individuals show a right hemisphere advantage.

In summary, although direct examination of CNS and ANS activity does not support the idea that psychopaths are generally underaroused, there is evidence to support the idea that psychopaths suffer from a weak BIS of arousal, or anxiety system, that leads to their lower levels of fear and poor abilities to inhibit a dominant response. In addition, there is evidence to suggest that psychopaths are less lateralized for processing both neutral and emotional verbal material.

Affect Intensity and Arousal

Larsen and Diener (1987) believe that the cause of emotional intensity differences lies in the regulation of different internal arousal levels. This idea is also based on Eysenck's (1967, 1977) theory of individual differences in arousal levels that underlie introversion and extroversion. Larsen and Diener (1987) claim that individuals high in affect intensity have lower baseline arousal levels than do low-AI individuals. Presumably, high-AI individuals emotionally respond to the same environmental stimuli more intensely in order to raise their arousal levels to an optimal level. Larsen and Diener do not specify the type of arousal to which they are referring and instead seem to use the term to refer to a general state of physiological and cortical activation.

To test the hypothesis that individuals high in affect intensity are underaroused in a manner similar to the underarousal of extroverted individuals, Williams (1989) investigated the relation between the Affect Intensity Measure (AIM: Larsen, 1984) and the Eysenck Personality Questionnaire (EPQ: Eysenck & Eysenck, 1975). Using 253 participants, he found that AIM scores correlated positively and significantly with Neuroticism (N) and Extroversion (E) ($r = .37$, $p < .001$ and $r = .27$, $p < .001$ respectively). A stepwise multiple regression indicated that AIM scores for the sample were a function ($R = 0.568$) of N ($B = 0.516$), E ($B = 0.442$), and Lie (L) ($B = 0.111$), accounting for 32.2% of the AIM variance. According to Williams, neuroticism was expected to play a role in affect intensity considering it has traditionally been equated with emotional arousability (Eysenck, 1967). The results of this study showed that extroversion primarily influenced positive affect intensity and neuroticism was the principal influence in negative affect intensity. It should be noted that although the correlations with affect intensity, extroversion, and neuroticism were statistically significant, they illustrate a small effect size and account for only about one third of the total variance in AIM scores. Therefore, additional evidence is necessary before making any conclusive statements regarding Eysenck's personality dimensions and affect intensity.

One difference between Eysenck's personality types and Larsen and Diener's individual difference characteristic is that, according to Larsen and Diener (1987), when exposed to the same stimulus, individuals high on affect intensity will respond emotionally in a more intense way than will those low on this dimension, due to low baseline levels of arousal. According to Eysenck (1977), extroverts will actively seek out situations with more intense or exciting qualities due to their low arousal levels. In other words, extroverts are individuals who engage in behavioral activities that place them in more stimulating environments, whereas individuals high in AI respond with intense emotionality to stimuli of medium intensity levels in order to regulate internal arousal levels.

Larsen and Diener attempt to clarify this issue by focusing on another mechanism used to regulate arousal. This CNS mechanism is said to regulate the intensity of a given stimulus. It is an individual difference characteristic called the reducer/augmenter dimension (Buchsbaum, 1975). The function of this mechanism is to modulate an individual's response to sensory stimulation by amplifying or reducing the effects of the stimulation. Thus, a person labeled a "reducer" will be generally overaroused or overstimulated, whereas an "augmenter" will be generally underaroused or understimulated. Therefore, augmenters should seek out situations with exciting qualities and reducers should attempt to minimize sensory stimulation or dampen the effects of stimulation due to their generally high arousal state. In this way, emotional responses can regulate internal arousal levels in a manner similar to regulation by behavioral activities. Larsen and Diener (1987) posit that individuals are high or low in affect intensity because they have developed an internal method of regulating their arousal by interpreting stimuli as more or less intense or stimulating. Increasing behavioral activities could be considered another method of arousal regulation.

To test this hypothesis, Larsen and Zarate (1991) studied the relation of affect intensity to the reducer/augmenter dimension. In this study, augmenting/reducing was measured by the G2 Reducer Index (Herzog, Williams, & Weintraub, 1985) which defines augmenting and reducing in a manner opposite to that previously described. In this context, reducers refer to individuals who are generally underaroused because they typically dampen the effects of sensory stimulation. Reducers, in this sense, would be more likely to engage in dangerous or exciting behaviors and to

experience intense emotions due to their typically low aroused condition. In contrast, augmenters in this study were individuals who ordinarily augment or intensify environmental stimuli and are therefore generally overaroused. These individuals would then be motivated to experience shallow emotions and to participate in situations of low stimulation in order to reduce their already high arousal state (Barnes, 1976; Petrie, 1967).

Larsen and Zarate (1991) induced boredom in participants by having them work on simple math problems for about 35 minutes and then gave them a choice of participating in an emotion induction study or a questionnaire study about their everyday behaviors. Results showed that reducers were more likely than augmenters to choose to participate in the emotion induction study. Reducers also completed fewer problems than augmenters during the boredom phase and rated this phase as less interesting and pleasant. By assessing the activity participants self-reported in their everyday lives, Larsen and Zarate also concluded that reducers seek activities that are potentially more emotion-invoking. This study shows that reducers/augmenters not only seek out activities with certain exciting qualities, but are also more or less likely to seek activities with a higher probability of inducing emotions. These findings indicate further that emotional responses, and not just behavioral activities, can be used to regulate internal arousal levels. Therefore, the study provides support for the presence of cognitive control strategies that increase or decrease an emotional response which, in turn could be used to regulate perceptions of arousal.

The results of a further study yielded a significant and negative correlation between affect intensity, heart rate in a stimulation-deprived environment, and galvanic skin response (specifically, the number of spontaneous spikes in a 1-minute interval) (Larsen, Diener, & Emmons, 1986). This study also showed that during a highly stimulating situation (85 db white noise), the proofreading performance increased for subjects high in AI and decreased for subjects low in AI. Based on this evidence, Larsen and Diener (1987) conclude that individuals high in affect intensity may indeed suffer from low arousal levels.

Project goals

The research on psychopaths has often focused on the emotions felt by individuals of this personality type and on their arousal levels (albeit, arousal has not maintained a consistent definition). Therefore, psychopaths, or individuals similar to them such as ASPs, comprise an ideal sample with which to investigate the arousal theory of affect intensity. The psychopathy construct has been linked to baseline arousal levels in a way that bears a striking resemblance to how the individual difference characteristic of affect intensity has been discussed in terms of baseline levels of arousal. However, as will be demonstrated, there is an inconsistency in the predictions implied by the affect intensity construct and those made by theories of psychopathy.

Larsen and Diener (1987) proposed that high affect intensity is related to low levels of baseline arousal; that is, individuals presumably develop a stable and consistent mode of responding in an emotionally intense way to compensate for their low levels of arousal. This theory does not coincide with the pattern of low affect intensity and low levels of baseline arousal predicted by the underarousal theory of psychopathy. Given the characteristic shallow affect and emotional deficiencies discussed previously, it seems likely that ASPs will be low in AI; however, if the arousal theory of affect intensity were correct, results would show that these ASPs were high in baseline levels of arousal. However, it seems unlikely that ASPs will show evidence of high arousal levels at rest.

One proposed explanation for the inconsistencies is that psychopaths (and ASPs) are not underaroused in a general sense. This explanation is based on the definition and measurement of arousal. It is unclear what is meant by the term "arousal" in both Larsen and Diener's (1987) underarousal theory of affect intensity and Hare's (1993) underarousal theory of psychopathy. The results of studies investigating these topics have typically discussed and compared arousal levels between groups using different operational definitions of arousal. In some studies, cortical arousal (such as EEGs and evoked potentials) were measured. Others measured ANS functioning (such as heart rate and skin conductance) whereas others used behavioral indices of arousal (such as reaction time, looking time, and self-reports). The studies have used the term "arousal" in its general and overinclusive sense; They have not specified the type of arousal to which they are referring which is problematic in that arousal may seem to be at different levels depending on how it is measured (Cohen, 1993). It is also unclear whether those high and low in affect intensity and psychopathy differ in arousal levels during resting baseline conditions, in reaction to stimulation (whether that be to sensory cues, behavioral activity levels, or emotional responses), or both at rest and in reaction to stimulation.

The current study will address these concerns by narrowing the type of arousal being measured to include only self-perceptions of arousal. The rationale for this choice is based upon current conceptualizations of arousal.

Theories of arousal regulation processes have advanced in sophistication with the acknowledgment that arousal is a multidimensional concept (Blascovich, 1990). Blascovich has developed a general model of arousal regulation which will be used in the current investigation of arousal and arousal regulation processes in individuals high and low in affect intensity and aberrant self-promotion. According to the model, arousal regulation begins with the perception of an eliciting stimulus which then leads to physiological arousal. Physiological arousal can be measured in the CNS by monitoring EEG patterns in various functional systems, or by measuring the activity in the ANS, the endocrine system, or even the immune system (Hugdahl, 1995). The association between the stimulus and physiological response is said to mediated and moderated by predisposing factors which include biological, physiological, and psychological factors such as cognitive and personality differences. The next link in Blascovich's model is between physiological arousal and arousal perception. This link is mediated and moderated by the same predisposing factors as those in the stimulus-arousal association. It is thought that there are wide individual differences between the intensity of physiological arousal and its perception. In other words, if two individuals experience the same levels of cardiovascular and electrodermal responses, they do not necessarily perceive themselves to be aroused at identical levels.

This model is an important addition to arousal regulation theories. For instance, many psychological explanations of behavior include discussions of arousal as a type of drive or motivating agent. As previously mentioned, theories of affect intensity and psychopathy not only discuss arousal as a cause of the intensity of emotional experiences and impulsive, sensation-seeking behavior, but they also suggest that perceptions of such arousal levels play a causal role. According to Blascovich and Katkin (1992), "to conduct experiments… without considering the ramifications of individual differences in the ability to detect or perceive that arousal is to invite a set of inconclusive results" (p. 85).

The relationship of affect intensity to basal, evoked, and perceived cardiac arousal was investigated by Blascovich and Katkin (1992). Although extrapolations from this study are limited in that only heart rate (HR) was assessed, it provides a solid base from which the

relationship of affect intensity to other aspects of arousal can be investigated. Basal arousal was assessed in the study by measuring the inter-beat intervals between successive R-waves of the electrocardiogram (EKG) during a five minute rest period. Evoked arousal was induced by exercise in the first experiment and by mental arithmetic in the second and third experiments. Perceived arousal was assessed by using an established heartbeat detection task. The task required the subject to determine whether auditory tones were coincident or noncoincident with their heartbeats. Results showed that for all subjects, heartbeat detection was better after exercise or after performing mental arithmetic than after resting. Correlations between affect intensity and resting heart rate, heart rate during exercise, and heart rate during mental arithmetic were not significant. In other words, there were no relationships between affect intensity and either basal or evoked cardiac arousal. However, there was a significant and negative relationship in three separate studies between affect intensity and performance on heartbeat detection tasks when performed in positions shown to be conducive to heartbeat detection accuracy. This indicates that the relationship between affect intensity and arousal is not due to differences in baseline arousal or arousal in reaction to stimulation. Instead, it is related to perceptions of arousal (at least when arousal is defined as HR responses).

Blascovich et al (1992) state that their results demonstrate how high-AIs are hyposensitive to their own arousal levels. Inasmuch as they are not very accurate perceivers of their own arousal, they should be motivated to regulate their emotion upward which explains why they report experiencing intense levels of emotion. Conversely, low-AIs are hypersensitive to their own arousal levels and so should be motivated to regulate their emotions downward, thus experiencing shallow levels of emotion.

This line of reasoning is consistent with Blascovich's (1990) model. According to the model, the extent to which an individual pays attention to their arousal and internal physiological cues is moderated by external cues such as social and environmental stimuli. This moderated relationship effects the attributions an individual makes for their arousal and the subsequent affect that is induced. Responses can then be made to regulate the level of affect. Based on these ideas, it follows that high-AI individuals who are not accurate perceivers of their body's physiology may rely more on external cues or demand characteristics of the situation when making attributions for their affect. In this way, they may be biased to report more intense emotions (Blascovich et al., 1992).

Studies such as these illustrate the importance of considering perceptions of arousal when conducting investigations about arousal levels and individual differences in arousal regulation strategies. In fact, it seems that a main determinant in arousal regulation processes is the connection between arousal and its perception. It is the perception of arousal that is the last stage in the arousal regulation model; Perception then most directly (in a temporal sense) influences the degree to which an individual engages in behavioral or cognitive activities to either raise or lower arousal. Blascovich's model has been applied to a number of social behaviors theoretically grounded in arousal regulation tactics. It seems logical then that perceptions of arousal would also be fundamental in explaining the characteristic behaviors of psychopaths and ASPs. Therefore, the current study will directly assess perceptions of arousal by way of self-report methods in individuals high and low in affect intensity and aberrant self-promotion.

Hypotheses

At present, it is unclear what is meant when it is said that psychopaths and individuals high in affect intensity are underaroused. In addition, as detailed previously, predictions from the theory of affect intensity differ from those of the traditional psychopathy model.

It is hypothesized that ASPs will score low on measures of affect intensity as measured by the Affect Intensity Measure (Larsen, 1984; AIM). The scores of the non-ASP controls will be expected to approximate a normal distribution in terms of affect intensity.

It is further hypothesized that ASPs will score low on a measure of arousability. Because ASPs are expected to be low in affect intensity and emotions are associated with aroused states, it is expected that ASPs will report low tendencies to become highly aroused. This finding would not necessarily indicate that ASPs experience low arousal during baseline or resting conditions, but only that ASPs do not feel that life circumstances often make them feel very aroused. In accordance with Larsen and Diener's (1987) theory, low-AIs are expected to report lower levels of arousability than high-AIs. Again, this finding would not address the baseline arousal issue, but would only indicate that high-AIs experience more arousal in response to stimulation.

The arousal theories of affect intensity and psychopathy will be examined by measuring self-perceived arousal levels after individuals complete computer tasks containing neutral words and emotional words. It is expected that individuals high and low in AI will differentially use emotional words as cues to regulate their perceived arousal either upward or downward in accordance with Lang's (1979) bio-informational theory of emotional imagery and Blascovich's (1990) model of arousal regulation. It will be assumed that emotions are coded in memory as a network of associations which are linked so that if one unit is activated, other units may also be stimulated (Lang, 1978; Frijda, 1987). The purpose of this design is to determine whether individuals of various characteristics (high-AI, low-AI, ASPs), differentially organize and code memories of emotional episodes. In other words, do they differentially categorize written words with an emotional or neutral valance as stimulus units in a network which in turn are linked to response units? According to Lang (1978), there are three different response unit types; behavioral acts, physiological mobilization, and expressive language. In this study, behavioral acts will be measured in the form of reaction time and accuracy scores and expressive language will be measured in the form of scores on a self-report arousal assessment device. As mentioned previously, physiological mobilization is not of interest in the current investigation.

ASPs are expected to react similarly to low-AIs in terms of their reaction times to neutral and emotional words on the computer tasks. The advantage of measuring reaction time over self-report methods of arousal measurement is that it assesses behavioral responses to perceived arousal in an on-line manner. Reaction time measures are frequently used in domains such as cognitive psychology where it is assumed that one way to infer the quantity of mental events in reaction to stimulation is to measure the time that elapses between the presentation of some stimulus and the person's behavioral response (Ashcraft, 1994; Posner & Petersen, 1990). Although reaction time differences may be small in magnitude, they have reliably differentiated between individuals in terms of attention (Ashcraft, 1994), intelligence (Sternberg, 1966), automatic and controlled processing (Schneider & Schiffrin, 1977) and many others. It is expected that ASPs, like low-AIs will not show differences in mean reaction times from the neutral to the emotional word task. ASPs and low-AIs are not expected to use emotional words as cues for behavioral regulation. In contrast, controls and high-AIs are expected to react significantly slower to emotional compared to neutral words. It is expected that for these

individuals, emotional words will serve as cues for future behavioral responses or verbal expressions and so a slowing response will occur due to the increase in attention paid to these 'important' words.

In addition to examining the affect intensity levels in ASPs, another purpose of this research is to clarify the discrepancies between arousal theories of affect intensity and psychopathy. This will be done in part by simplifying the multidimensional concept of arousal and examining one instrumental aspect of arousal regulation; perceptions of arousal. Unlike low-AIs, ASPs are not expected to show differences in perceptions of Energy and Tension dimensions of arousal as assessed after both the emotional and neutral word tasks. In this manner, it will be shown that ASPs do not differentiate between neutral and emotional words or use emotional words as cues to regulate their arousal. In contrast, the low-AI group is expected to use emotional words as cues to decrease their energetic and tense arousal and the high-AI group is expected to increase their energetic and tense arousal reports after the emotional word task. In other words, ASPs are expected to differ from low-AIs in terms of their perceptions of these types of arousal and their use of emotional stimuli to alter such arousal levels.

Unless specified otherwise, all hypotheses will be tested using one-tailed planned comparisons with an overall analysis of variance (ANOVA) or analysis of covariance (ANCOVA) using Arousal P scores as the covariate . Significant differences will be assessed by Duncan's multiple-range method, which tests all pairs of means rather than comparing experimental group means to a control group mean. The alpha level for the differences represented by the one-tailed a priori comparisons will be set at .05 for all analyses.

The following hypotheses predict nontrivial effects as well as the absence of nontrivial effects. Although traditional significance testing is biased against predicting a lack of effect (i.e. predicting the null hypothesis), there is reason to believe that if appropriate procedures are used to guard against alternative hypotheses as possible explanations for observed results, meaningful conclusions can be made based on findings of no difference (Cortina & Folger, 1998). The Neyman-Pearson (1928, 1933) position on hypothesis testing asserts that traditional statistics tell researchers the probability that the data would have been observed if the null hypothesis were true. Typically, if researchers obtain a p value that is small in one study, their future research is conducted under the assumption that the null is false. The current research will be based on the Neyman-Pearson tradition in that the null will be treated as confirmed (although in a tentative, probational sense) if obtained p values are larger than a predetermined cutoff. In fact, Cortina and Folger (1998) have argued that not to examine null effects may hamper scientific progress in that the understanding of the phenomena in question will be incomplete; examining null hypotheses is often important when establishing the boundary conditions of an effect.

The predictions of null effects that follow will be tested in accordance with the guidelines made explicit by Cortina and Folger (1998). First, null effects will be predicted based on theory in advance of data analysis. The null effects will be predicted along with hypotheses predicting the presence of an effect with which the null effect will be compared. In this way, it will be shown that sufficient effort was made to reject the null hypothesis when it was theoretically rational to do so. Secondly, the p value for these hypotheses will be set liberally at .10 to demonstrate that inferences of failures to reject the null are justified even when slight nontrivial effects are potentially present. Finally, confidence intervals will be computed regarding the hypothesized null to show that they do not include nontrivial effect values. Using these methods

will demonstrate that certain patterns of behaviors which occur for some subgroups of individuals fail to occur for other subgroups.

Affect Intensity

It is hypothesized that:

1. The mean AIM score for the ASP group will be significantly lower than the mean of the control group.
2. The mean AIM score for the ASP group will be significantly lower than the mean of the high-AI group.
3. The mean AIM score for the ASPs will not be significantly different from the mean of the low-AIs.

Stable Trait Arousability

It is hypothesized that:

4. The ASP group will score significantly lower on the Arousal Predisposition Scale than will the control group.
5. The high-AI group will score significantly higher on the Arousal Predisposition Scale than will the low-AI group.
6. The ASP group will score significantly lower on the Arousal Predisposition Scale than will the group of high-AI individuals.

Reaction Times to Emotional and Neutral Words

Non-independent sample t-tests will be conducted to test the significance of reaction time differences within a group and across conditions of word type. Specifically, it is hypothesized that:

7. The control group will show a significantly slower reaction time in the emotional versus the neutral word task.
8. The high-AI group will show a significantly slower reaction time in the emotional versus the neutral word task.
9. The ASP group is not expected to show a significant difference in mean reaction time to emotional versus neutral words.
10. The low-AI group is not expected to show a significant difference in mean reaction time to emotional versus neutral words.

Reaction times for emotional words (regardless of valance) will be compared to reaction times for neutral words between pairs of the four experimental groups to test hypothesized interactions between group and word type. It is hypothesized that:

11. The mean reaction time to emotional words will be significantly higher in the control group than in the ASP group.
12. The mean reaction time to emotional words will be significantly higher in the high-AI group than in the low-AI group.
13. The mean reaction time to emotional words will be significantly lower in the ASP group than in the high-AI group.
14. The mean reaction time to neutral words will be significantly higher in the high-AI group than in the low-AI group

Reaction Time Change

A one-way ANCOVA with planned comparisons will be conducted on reaction time change data. A reaction time change score will be computed for each participant based on the

participant's mean reaction time in the emotional word condition minus his or her mean reaction time during the neutral word condition. From these individual change scores, a mean change score will be computed for each group. This mean change scores will represent the average reaction time change from neutral to emotional conditions among the participants constituting each group. Therefore, positive mean change scores will indicate that participants responded slower to emotional words than to neutral words. No negative mean change scores are expected. The following hypotheses are predicted:

15. The mean change score will be significantly greater for the control group than for the ASP group.
16. The mean change score will be significantly greater for the high-AI group than for the low-AI group.
17. The mean change score will be significantly greater for the high-AI group than for the ASP group.
18. No significant differences in mean reaction time changes are expected between the ASP group and the low-AI group.

Reaction Times to Positive, Negative, and Neutral Words

A subsequent analysis will be performed separating the group of emotional words into positive and negative groups to distinguish possible differences in reaction time based on emotional valance. For example, words such as "nursery", "rattlesnake", "coffin", "cult", "friend", "bride" would all be classified as emotional words in the previous analyses. However, in the current analysis, "nursery", "friend", and "bride" will be classified as positive, and "rattlesnake", "coffin", and "cult" will be placed in the negative category. Specifically, a 4 (group) by 3 (word type –positive, negative, and neutral) ANCOVA will be conducted to examine mean reaction times differences among the four groups, controlling for scores on the Arousal Predisposition Scale. It is expected that ASPs will not differentiate between positive and negative words and therefore they will display similar mean reaction times to positive and negative words. However, this analysis is primarily exploratory so no other specific predictions will be made.

Accuracy

The percentage of correct responses during the computer task will be computed and compared across the ASP and non-ASP groups. A main effect for word type (e.g., emotional vs. neutral) in a 2 (group) X 2 (word type) ANCOVA is expected, based on the finding that both psychopaths and nonpsychopaths were more accurate in response to emotional compared to neutral words on a similar task (Williamson, Harpur, & Hare, 1991). The present study is expected to replicate this result using ASPs vs. non-ASPs, thus supporting the generalizability of the psychopathy construct to aberrant self-promotion. Once again, scores on the Arousal Predisposition Scale will serve as the covariate. However, because psychopaths and nonpsychopaths showed similar increases in accuracy for emotional words, group differences are not expected in the current study. Therefore, analyses on accuracy scores will be conducted in an exploratory fashion and as a manipulation check on the generalizability of the current ASP study to psychopathy research.

Transitory State Arousal

Arousal levels for emotional and neutral words. Separate non-independent sample t-tests will be conducted on the Energy and Tension dimensions of arousal, based on data collected

from Form A and Form B of the Activation-Deactivation Adjective Checklist. Mean differences in self-reported arousal within groups, after processing emotional compared to neutral words, will be tested for significance. Hypotheses 19a-25a pertain to differences in Energy arousal.

19a. The control group will report more Energy arousal after processing emotional, compared to neutral, material.

20a. The high-AI group will report more Energy arousal after processing emotional, compared to neutral, material.

21a. The ASP group is not expected to show significant differences in reports of Energy arousal after processing emotional, compared to neutral, material

22a. The low-AI group will report less Energy arousal after processing emotional, compared to neutral, material.

Interaction effects are expected between groups and word types. Specifically, it is hypothesized that:

23a. The ASP group will report less arousal on the Energy dimension than will the control group after processing emotional words.

24a. The high-AI group will report more arousal on the Energy dimension than will the low-AI group after processing emotional words.

25a. The low-AI group will report less arousal on the Energy dimension than will the ASP group after processing emotional words.

No significant differences are expected between groups on the Energy dimension of arousal after processing neutral words.

Hypotheses 19b-25b pertain to differences in Tension arousal. It is predicted that:

19b. The control group will report more arousal on the Tension dimension after processing emotional, compared to neutral, material.

20b. The high-AI group will report more arousal on the Tension dimension after processing emotional, compared to neutral, material.

21b. The ASP group is not expected to show significant differences in reports of Tension arousal after processing emotional, compared to neutral, material

22b. The low-AI group will report less Tension arousal after processing emotional, compared to neutral, material.

23b. The ASP group will report less arousal on the Tension dimension than will the control group after processing emotional words.

24b. The high-AI group will report more arousal on the Tension dimension than will the low-AI group after processing emotional words.

25b. The low-AI group will report less arousal on the Tension dimension compared to the ASP group after processing emotional words.

Arousal change. Two one-way ANCOVAs with planned comparisons will be conducted on arousal change data. Arousal change will be computed as the participant's mean arousal score in the emotional word condition minus his or her mean arousal score during the neutral word condition. Two mean difference scores will be computed for each individual: one for Energy and one for Tension. Thus, two mean change scores will be computed for each group. These group mean change scores will represent the average Energy and Tension arousal change from neutral to emotional conditions for each participant in each group. Therefore, positive mean change scores will indicate an arousal increase from neutral to emotional word conditions. The following hypotheses are predicted:

26a. The mean change score for the control group on reported Energy will be significantly more positive than the mean change score for the ASP group.

27a. The mean change score on reported Energy arousal will be significantly more positive for the high-AI group than for the low-AI group.

28a. The mean change score on reported Energy arousal will be significantly more positive for the high-AI group than for the ASP group.

29a. The mean change score on reported Energy arousal will be significantly more negative for the low-AIs compared to the ASP group.

The following hypotheses concerning Tension arousal are predicted

26b. The mean change score for the control group on reported Tension will be significantly more positive than that of the ASP group.

27b. The mean change score on reported Tension arousal will be significantly more positive for the high-AI group than for the low-AI group.

28b. The mean change score on reported Tension arousal will be significantly more positive for the high-AI group than for the ASP group.

29b. The mean change score on reported Tension arousal will be significantly more negative for the low-AIs compared to the ASP group.

Method

Assessment Phase

Participants

Male and female undergraduate students (N = 457) who were 18 years or older and enrolled in one or more psychology courses at Virginia Tech participated in the assessment phase of the study. Individuals spent approximately an hour and a half completing the questionnaires administered at that time. All participants were given two extra credit points and were entered in a lottery offering monetary prizes which ranged in value from $50 to $150. Testing occurred between the hours of 5:00 and 8:00 p.m. for all individuals. Sixty-nine percent of the sample were female; 31% were male.

Measures

Arousability. The arousability of the participants was assessed via the Arousal Predisposition Scale (Arousal P; Coren, 1988). This is a 12 item self-report inventory designed to evaluate individual differences in terms of a predisposition toward arousal (i.e. arousability). Items are scored on a five point scale ranging from 1 (for "never") to 5 (for "always") and summed to arrive at the total Arousal P score. The split-half reliability of this instrument is 0.83 (Coren, 1988). This inventory was constructed based on the idea that arousal is not a unidimensional process, but consists instead of at least two subdimensions: somatic arousal and cognitive arousal.

The Arousal P was initially designed to assess cognitive arousability, which is conceptualized as a trait or predisposition. Consistent with this assumption, the Arousal P has been demonstrated to be a valid and reliable predictor of several types of sleep disturbances (Coren, 1988) long thought to be related to arousal disorders. It has also been shown that high-arousable individuals, as determined by the Arousal P, show a greater change from pre-task levels of arousal to arousal levels after a distraction task than do low-arousable individuals (Coren & Aks, 1991). In this study, arousal was defined as the self-reported assessment of the body as it ranges from a generally activated to a deactivated state. In addition, the Arousal P has been validated against students' self-ratings of general levels of health and physical symptoms

which relate to stress and anxiety (Hicks, Conti, & Nellis, 1992). Individuals who were high in arousability reported a significantly higher number of stress-related symptoms and lower overall health than did those low in arousability. Normative data on the Arousal P can be found in Coren (1990).

Coren and Mah (1993) exposed subjects to an arousing 105 dB white noise and measured electrodermal and electromyographic activity as indices of autonomic and affective arousal. They found that individuals with high scores on the Arousal P showed greater changes from baseline in electrodermal and electromyographic activity than did individuals whose Arousal P scores were low. This finding suggests that this self-report index of arousal is a composite measures which assesses both somatic and cognitive dimensions of arousal (Coren & Aks, 1991).

Aberrant self-promotion. All participants were given a 179-item questionnaire which has been previously used in the assessment of the validity of aberrant self-promotion (Gustafson & Ritzer, 1995). The questionnaire is composed of five personality instruments designed to reveal ASP and non-ASP patterns. The instruments are: (1) the 40-item Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979, 1981); (2) the 54-item Socialization subscale of the California Psychological Inventory (CPI; Gough, 1987); (3) the 10-item version (M-C 1 (10); Strahan & Gerbasi, 1972) of the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960); (4) an 11-item self-esteem measure taken form the Organizational Climate Questionnaire (OCQ; Jones & James, 1979); and (5) the 58-item Self-Report of Psychopathy II (SRP II; Harpur & Hare, 1989), plus six additional items developed specifically for the Gustafson & Ritzer (1995) study.

The standardized total scores for four of the variables (narcissism, socialization, social desirability, and self-reported psychopathy) were used in a cluster analysis conducted with the computer program SLEIPNER (Bergman & El-Khouri, 1995). The Ward (1963) minimum variance clustering algorithm was used to cluster individuals into homogeneous groups based on scores from the previously mentioned variables. The Ward method is a hierarchical agglomerative method which means every individual's pattern of scores across a set of variables is initially treated as a separate cluster. The most similar cases are then sequentially merged by joining the cases that result in the minimum increase in the error sum of squares, thereby reducing the data set to one cluster containing all individuals. This method has been shown to be useful in identifying known groupings in data sets in applied settings such as psychology (Aldenderfer & Blashfield, 1984). One criterion used in deciding the number of clusters to retain was the increase in the error sum of squares (within-cluster variance) linked with retaining a certain number of clusters compared to the error sums of squares associated with the solution containing one cluster more. The optimal solution is one which minimizes error while maintaining a parsimonious number of clusters (Gustafson & Magnusson, 1991). Another criterion used in deciding the number of clusters to retain was the percentage reduction in error variance (PR) coincident with a particular number of clusters compared to the total variance of the sample across all the variables (Bergman, 1988). Gustafson and Magnusson (1991) compare the PR statistic to the "percent-variance explained" used in factor analysis.

Through this method, the sample was divided into an eight cluster solution. Two of these eight clusters had mean scores on the four identifying variables that were consistent with the construct of aberrant self-promotion. That is, the mean socialization scores and social desirability scores were lower than the overall sample's mean scores on these variables and the mean self-reported psychopathy scores and narcissism scores were higher than the overall

sample's mean scores. However, upon closer examination, it became apparent that not all of the individuals constituting the two identified clusters contained individuals with scores on the four variables that were significantly different from the entire sample's mean scores in the expected direction. Therefore, the cluster analysis was simply used as a guide to select ASPs. Individuals were selected from one of the two ASP-like clusters and identified as ASPs if their mean scores on all four factors were at least 1/3 of a standard deviation away from the overall sample's means in the expected direction. By this method, ASPs (n = 47) had socialization scores that were < 34, social desirability scores that were < 4, self-reported psychopathy scores that were > 183, and narcissism scores that were > 17. 10.3% of the total sample were identified as ASPs which is consistent with previous ASP research which has shown that ASPs represent between six and eleven percent of similar samples (Gustafson & Ritzer, 1995).

A sub-sample of students who demonstrated the opposite pattern of scores across the four factors and who exhibited at least average self-esteem were selected as controls. The mean scores for the sample of controls (n = 160) were 38.77 for socialization, 5.11 for social desirability, 159.51 for self-reported psychopathy, and 8.56 for narcissism. To be included in the control group, individuals had to score at or above the overall sample's mean self-esteem score (= 42). Thirty of these individuals were randomly selected to undergo additional testing.

Thirty of the 47 ASPs were also randomly selected and used in subsequent testing procedures. The means and standard deviations for the full sample, the control group, and the ASP group are displayed in Table 1. T-tests for paired samples indicate that ASPs had significantly lower California Personality Inventory scores and significantly lower Marlowe-Crowne social desirability scores than controls ($t(30) = 7.42$, $p = .000$ and $t(30) = 7.83$, $p = .000$ respectively). T-tests for paired samples also indicate that ASPs had significantly higher Self-Reported Psychopathy scores and higher Narcissistic Personality Inventory scores than controls ($t(30) = -9.75$, $p = .000$ and $t(30) = -14.73$, $p = .000$ respectively).

Momentary arousal. Each participant was asked to complete Thayer's Activation-Deactivation Adjective Check List (AD ACL) (1967, 1978a). The AD ACL is a self-report test which was constructed to provide rapid assessments of arousal states as they vary from moment to moment. Investigations into the checklist have shown that it is based on a multidimensional model of arousal that includes two main dimensions: energetic arousal and tense arousal. These two dimensions have been shown to be positively correlated at medium levels of intensity and negatively correlated at extreme levels (Thayer, 1978b, 1989). Four scales comprise the two main dimensions – Energy-Tiredness and Tension-Calmness. The checklist takes several minutes to complete and requires the participant to rate a series of adjectives on a four-point scale ("definitely feel", "feel slightly", "cannot decide", and "definitely do not feel") with instructions to rate their feelings at the moment. The AD ACL contains adjectives previously shown to load significantly on the subscales of Energy, Tiredness, Tension, and Calmness as well as filler adjectives to disguise the purpose of the inventory.

According to Thayer (1978b), the Energy-Tiredness dimension underlies most behavior. This dimension varies within the day and coincides with the sleep-wake cycle of the individual such that Energy reaches its highest point around noon for most people. When individuals reported on the AD ACL following exercise, physical exertion had the greatest effect on scores along the Energy scale, with the next greatest effect occurring along the Tiredness scale, and the least effect on the Calmness scale. The individual's subjective perceptions of energy, vigor, and drowsiness (aspects of the Energy-Tiredness dimension), also seem to underlie many cognitive

activities, especially verbal processes and to be weakly correlated with positive affect. For example, Thayer and Cox (1970) found that scores on the Energy-Tiredness dimension of the AD ACL reliably predicted performance on complex and noncomplex verbal learning tasks.

The second major dimension, Tension-Calmness, is associated with individuals' perceptions of their bodily reactions, including feelings ranging from tension to placidity. This aspect of arousal is said to form the basis for most emotions and feelings of stress. It has been shown that reports along the AD ACL for students before an exam compared to students on a typical school day were most effected along the Tension-Calmness dimension (Thayer, 1978b). Tension-Calmness is also said to mediate some cognitive and motor functions (although not to the same extent as Energy-Tiredness) and is weakly associated with negative affect. Thayer's model assumes there are two bipolar dimensions of arousal so that assessments can be made on the four points as if they were independent aspects. However, it is reported (Thayer, 1989) that many studies use only the Energy and Tension scores because these seem to be the best indicators of energetic and tense arousal respectively. In accordance with this recommendation, two scores will be computed for each individual based on his or her responses to the AD ACL: one indicating the level of energetic arousal (Energy) and one indicating the level of tense arousal (Tension).

Creation of parallel tests. The purpose of administering the AD ACL in its entirety during the mass testing session was to collect data to be used to develop short, parallel versions of the instrument. These parallel measures will be employed during the testing phase of the study.

To develop these parallel measures, the test was split into two versions, Form A and Form B, which contain an equal number of adjectives previously shown to load strongly on the factors of Energy, Tiredness, Tension, and Calmness (as determined in Thayer, 1967, 1978a). An equal number of "filler" adjectives were added to the sets of activation adjectives to help disguise the nature of the tests. Thus, although the two forms are designed to assess the same dimensions of arousal, identical adjectives are not used for both forms. Form A and Form B of the Ad ACL can be seen in Appendix A and Appendix B, respectively.

Pearson product correlations were computed on the sample's (N = 348) Energy (E) score for Form A and the E score for Form B. Results indicate a strong, positive correlation for the two forms (r = .78, p = .000) on this dimension. A separate analysis was conducted on the Tension (T) scores for Form A and Form B. Again the correlation was strong and positive (r = .75, p = .000) indicating that the two forms of the AD ACL are essentially equivalent.

A self-report measure of affect intensity. To form groups of individuals who experience high or low levels of emotional intensity, the Affect Intensity Measure (AIM) described by Larsen (1984) was administered to all subjects. The AIM is a 40-item questionnaire which asks subjects how frequently they experience emotions of particular intensities in certain situations. Respondents answer on a six point scale ranging from "never" to "always" for positive and negative emotions. The AIM includes items such as "When I accomplish something difficult I feel delighted or elated" and "The sight of someone who is hurt badly affects me strongly". This index was designed to measure the intensity of an emotion unconfounded with the emotion's frequency of occurrence. The items were also designed according to the principle that emotional intensity is manifest in various domains, including cognitive abilities such as concentration and physical responses such as a pounding heart and sweating palms.

The AIM appears to measure a particularly stable individual difference characteristic. The test-retest reliabilities for the AIM are high; .80, .81, and .81 at 1, 2, and 3-month intervals respectively (Larsen, 1984). Moreover, the correlation between AIM scores assessed two years apart is .75 (Larsen & Diener, 1987). Finally, the convergent validity of the AIM has been demonstrated with the finding that parental reports of their offspring's emotional intensity correlated .50 with the AIM (Larsen & Diener, 1987).

The AIM was scored by averaging the responses for the 40 items after reverse scoring 11 of the items and calculating a mean response score for each individual. Higher scores are indicative of higher levels of affect intensity (AI). In accordance with previous research using the AIM (Larsen & Diener, 1987; Dritschel & Teasdale, 1991), individuals whose scores fell in the highest and lowest quartiles of the sample's mean AIM score distribution were considered individuals high and low in AI, respectively. The mean AIM score of the sample (N =370) was 2.84 (SD = .53). Therefore, high-AIs (n =44) were those individuals who had a mean AIM score of 3.24 or higher and low-AIs (n =45) were those with a mean AIM score of 2.44 or lower. The mean AIM score for the groups of high-(M = 3.58, SD = .26) and low-AI (M = 2.2, SD = .38) individuals are similar to those found in other studies (Larsen, Diener, & Cropanzano, 1987; Larsen & Diener, 1987).

Testing Phase

Participants

Individuals previously classified as ASPs (n =30), high-AIs (n =30), and low-AIs (n =30) participated in further studies. Although the participants included in the high-AI and low-AI groups are not aberrant self-promoters, these two groups consist of individuals with extremely high and low scores on the AIM, respectively. Therefore, a fourth group labeled "controls" (n =30) was constructed and consists of a random sample of individuals who did not demonstrate the ASP pattern on the 179 item questionnaire. Because they were selected at random, the distribution of AIM scores for the group of "controls" are representative of the entire sample's distribution. Thus, this group serves as a control group for the ASPs.

A monetary lottery was used as an incentive for participation. At the conclusion of the study, the name's of six participants were randomly drawn. The participants were then telephoned to inform him or her of winning, and paid immediately by personal check. In addition, participants enrolled in psychology courses which allowed extra credit to be earned for participation in psychology experiments were given one extra credit point for that course. Approximately thirty-five minutes were required to perform the tasks involved in the second phase of the study. Participants were telephoned to set up individual appointments which were all scheduled between the hours of 4:00 and 8:00 p.m. to control for diurnal fluctuations in perceptions of arousal (Matthews & Harley, 1993).

Procedure

First testing session. Participants were tested on an individual basis with male and female undergraduate research assistants who were trained to administer the procedure. The assistants were blind to the personality profile of the participant. When participants arrived at the lab, the informed consent form was reviewed orally with the participant. Participants were asked to sign the consent form once they verbalized their understanding of the project and had no more questions.

Individuals were then seated in a sound-attenuated room in front of a computer screen and tested for their processing of emotional or neutral verbal material. They had to respond

"yes" or "no" to the question "Is this a word or not?" when an affectively positive (N = 20), negative (N = 20), or neutral word (N = 40), or a pronounceable non-word was presented on the computer screen. Stimulus words and non-words were taken from a study conducted by Hartley, Ireland, Arnold, & Spencer (1991) which were matched for length (3-8 letters) and number of syllables (1-3). Words in this study were chosen from the Monash Free Association Norms (Thompson, Merdith, & Browning, 1976) and were judged by independent raters in terms of their positive, negative, or neutral values. Words were ultimately chosen based on extreme ratings of content. Pronounceable non-words were created by altering one or more letters for each of the selected words so that the result was a meaningless letter string which was still pronounceable. Words used in the current study can be seen in Appendix C.

All participants were seated approximately 45 cm from the monitor. Strings of letters were presented on the computer screen for 200 milliseconds (ms) in capital letters. The letters were white and presented in the center of a black screen. Participants were asked to fixate on a central point (an asterisk) and use their dominant index finger to press the key on a computer keyboard clearly marked as "yes" or "no". They were asked to press "yes" whenever a string of letters formed an English word or to press the key marked "no" whenever the letter string did not form an English word. They were asked to respond as accurately and rapidly as possible.

Stimuli were presented through the SHOWTIME software program (1995). Reaction times of the participants were computed based on the time between the offset of the stimulus presentation and pressing the "yes" or "no" button. The program also computed accuracy scores based on the number of correct and incorrect responses made by the individual. If no response was made within 2 seconds (s) after the offset of the stimulus, the event was labeled a "time out" and treated as an incorrect response in subsequent analyses.

Before the start of the experiment, participants practiced the task by responding to 2 trials of 10 stimuli each. Words presented in the practice session were neutral in affective tone and differed from the neutral words presented in the actual procedure. There was a 3s delay after a response before the next letter string was presented. If no response was made, the next stimulus was presented 3s after the offset of the previous letter string. A 10s delay occurred between trials.

Upon completion of the practice session and after all questions had been answered, recording began. Each participant was presented with 8 trials of 10 stimuli each. As with the practice session, there was a 3s delay after participants either made a response or after stimulus presentation if no response was made. The intertrial interval was 10s. Words and non-words appeared in random order for all participants and were presented only one time.

The words in the first testing session either consisted entirely of neutral words or entirely of words with an emotional valance (a mix of both positive and negative). Individuals who received emotional words during the first testing session received neutral words during the second testing session. Conversely, individuals who performed the procedure with neutral words during the first testing session received emotional words during the second testing session. This order presentation was balanced across individuals to eliminate potential order effects.

Following the first testing session, individuals were asked to complete a previously constructed version of the AD ACL (Form A and Form B were counterbalanced across individuals). In this manner, participants' perceptions of the Energy and Tension dimensions of arousal were measured immediately following a task which required them to perceive and make decisions about verbal material with an emotional (or neutral) content.

Eysenck Personality Questionnaire (EPQ: Eysenck & Eysenck, 1975). At the end of the first testing session, participants were asked to complete the EPQ. Thus, a short break intervened between administrations of the computer task. The EPQ assesses the dimensions of Extroversion (E), Neuroticism (N), and Psychoticism (P), as well as Lying (L). The EPQ was administered to examine Larsen and Diener's (1987) hypothesis that individuals high in affect intensity are generally underaroused and therefore high in extroversion. The EPQ is a 90 item questionnaire that asks participants to answer "yes" or "no" to a variety of questions designed to assess the E, N, P, and L aspects of personality.

Second testing session. The participant then completed a second testing session by repeating the basic form of the computer task carried out during the first testing session. This time, the words presented were either emotional or neutral (whichever was not used previously). Words and non-words used as stimuli in the completion of the first computer task were not repeated in the second testing session. Again, reaction times and accuracy scores were computed during this activity. Finally, Form A or Form B created from the AD ACL was again completed based on participants' subjective perception of their arousal following the second testing session.

Upon completion of the tasks, the participant was debriefed concerning the purpose of the study. All questions were answered and the individual was thanked for his or her participation and excused.

Results

As the tables and figures demonstrate, the within-group variance was high in many of the following analyses; high within-group variance creates distributions for which the arithmetic mean does not reflect a true "central tendency." Thus, statistical tests that rely on the comparisons of means (e.g. ANOVA, ANCOVA, t-tests) tended to yield non-significant results.

Affect Intensity

An omnibus one-way ANOVA with planned comparisons was conducted to test the hypotheses involving the Affect Intensity Measure (AIM) scores. All four groups were included in this overall test to control for the family-wise error rate. A significant main effect for group ($F(3, 119) = 53.38$, $p = .000$) was observed. As shown in Table 2, Duncan's multiple range tests demonstrated that ASPs exhibited AIM scores that were (a) significantly lower than those of the high-AIs; (b) significantly higher than those of the low-AIs; and (c) not significantly different from those of the controls. Table 2 also demonstrates that high-AIs scored significantly higher on the AIM than did low-AIs; Of course, this result simply expressed the extreme-group definition numerically because the members of these two groups were chosen based on the extreme nature of their AIM score. These results supported hypothesis 2 but did not support hypotheses 1 and 3. Although it had been predicted that ASPs would score lower than high-AIs on the AIM, it was surprising to find that they scored higher than low-AIs and no lower than controls.

To clarify this issue, the distribution of AIM scores by groups is shown in Figure 1. The figure illustrates that although AIM scores were normally distributed in the control group, they were positively skewed in the ASP group. In addition, the variability of scores in the ASP group was larger than that observed in any other group. Therefore, the mean may not be an appropriate measure of comparison in this case. However, the figure demonstrates that approximately two thirds of the ASPs had AIM scores that fell below the entire sample's mean. A Z test of proportion indicated that a significantly higher proportion of ASPs exhibited low, as compared to high, AIM scores ($Z = 2.008$, $p < .05$). A 95% confidence interval demonstrated that between

54% and 86% of ASPs can be classified as low in AI. In contrast, the proportion of controls who were classified as low in AI was no different from those classified as high in AI.

This information indicates that although all of the initial hypotheses were not supported (ASPs, as an entire group, were not low in AI), the majority of the ASPs were low in AI. It may be that ASPs, like psychopaths, should be divided into primary and secondary types with primary ASPs being those ASPs who are low in AI. Because the initial hypotheses explicitly predicted differences between the four experimental groups of $n = 30$, the results of these analyses will now be presented. However, the differences between groups on the remaining dependent variables were predicted under the assumption that the ASP group would consist of a homogeneous sample of low-AI individuals. Because of the variability in AI scores among the ASPs, many of the following analyses did not support the original hypotheses.

Stable Trait Arousability

An omnibus one-way ANOVA with planned comparisons was conducted to test differences in mean scores on the Arousal Predisposition Scale (Arousal P) between groups. Means and standard deviations are presented in Table 2. The overall comparison showed a main effect for group ($F(3, 114) = 15.68$, $p = .000$). In support of hypothesis 5, planned comparisons revealed that the high-AI group had significantly higher arousal P scores than did the low-AI group. However, in contrast to expectations (hypothesis 6), ASPs were did not score significantly lower than high-AIs in terms of arousability: In fact, the ASP group exhibited significantly higher Arousal P scores than did the low-AI group and the controls; findings which contradict hypothesis 4.

A Pearson product correlation was computed on the sample's ($N = 120$) mean AIM scores and mean Arousal P scores. Results indicate a strong, positive correlation between affect intensity and arousability ($r = .62$, $p = .000$).

Reaction Times to Emotional and Neutral Words

Order effects. Analyses were conducted to ascertain whether or not reaction time data were affected by the order in which the two types of stimuli (neutral words vs. emotional words) were presented. Separate 4 (group) by 2 (stimuli order) ANCOVAs were conducted with the Arousal P score used as a covariate to control for individual differences in arousability. For task order, individuals were divided into groups that either (a) completed the computer task with neutral words first or (b) completed the task with emotional words first. Results indicated that reaction times when neutral words were presented first did not differ from reaction times when emotional words were presented first.

Reaction times. A 4 (group) X 2 (word type) ANCOVA with planned comparisons was performed on the reaction time data. The arousal scale score was again used as a covariate, to control for the effect of a stable arousability predisposition on reaction times. This covariate was employed in lieu of a third administration of the Activation-Deactivation Adjective Checklist (AD ACL) as a baseline measure.

Among the four experimental groups (ASPs, controls, high-AIs, low-AIs) reaction times for emotional words were compared to reaction times for neutral words to test for hypothesized interactions between group and word type. Results showed a main effect for word type ($F(1, 235) = 6.52$, $p = .01$) only. Follow-up t-tests were conducted to assess the significance of reaction time differences for each pair of groups. Results from these analyses (data are presented graphically in Figure 2) indicated that for all four groups, reaction times were slower during the computer task involving emotional words than they were during the computer task containing

neutral words. These findings supported hypotheses concerning the control group and high-AI group (hypotheses 7 and 8). However, ASPs and low-AIs were not expected to demonstrate a similar slowing to emotional words. Therefore, data did not support hypotheses 9 and 10. The failure to find a main effect for group or a significant interaction effect for group X word type indicated that hypotheses 11-14 also were not supported.

Reaction time change. Power to detect interactions was reduced in the previously-mentioned ANCOVA because the ANCOVA model dictates that main effects be examined first. In contrast, a change score allowed interaction effects to be tested directly, with maximum power. A reaction time change score was computed for each individual, based on the individual's mean reaction time in the emotional word condition minus his or her mean reaction time in the neutral word condition. From these individual change scores, a mean change score was then computed for each group. Positive mean change scores indicated that participants responded more slowly to emotional words than to neutral words.

A one-way ANCOVA with planned comparisons was then conducted on the reaction time change data. Contrary to hypotheses 15-17, however, the groups did not differ significantly with regard to their mean reaction time change scores. Instead, all groups showed a similar degree of slowing to emotional stimuli. The only expected finding was that ASPs' mean change score would not differ significantly from low-AIs' mean change score (hypothesis 18). However, because other hypotheses were not supported in this analysis, this result should be regarded with skepticism.

Accuracy

The number of correct responses during the computer tasks were computed and compared across groups. T-tests for paired samples showed that the group of ASPs was the only group that showed a significant difference in accuracy scores across word types. ASPs were significantly more correct in identifying neutral words than in identifying emotional words ($t(29) = -3.54$, $p = .001$). Although this result may reflect Type I error, it is somewhat interesting that all groups, except the ASPs, displayed virtually perfect accuracy, regardless of word type.

This finding does not replicate results found for psychopaths on a similar task (Williamson, Harpur, & Hare , 1991). Williamson, Harpur, and Hare (1991) found that both psychopaths and non-psychopaths were more accurate to emotional compared to neutral words. However, although the results from the current study indicate that ASPs reliably made more errors in the emotional word task, the magnitude of this difference was small. As shown in Table 3, ASPs only answered approximately one more question correctly in the neutral compared to the emotional word task out of forty questions. Therefore, the practical value of this finding is questionable.

Transitory State Arousal

Energetic arousal. A 4 (group) X 2 (word type) ANCOVA with planned comparisons was performed for the Energy dimension of arousal using Arousal P scores as the covariate. Energetic arousal after processing emotional words was compared to energetic arousal after processing neutral words, based on reports from Form A and Form B of the AD ACL. The analysis revealed a significant main effect for group ($F(3, 235) = 1.8$, $p < .05$), but no main effect for word type and no significant interaction between group and word type. Specifically, as predicted, there were no significant differences in energetic arousal between groups after the neutral computer task. However, as hypothesized (23a), the ASP group reported significantly less energy arousal than did the non-ASP control group after processing emotional words (as

shown by Duncan's multiple range test with significance level set at .05). Contrary to hypotheses (24a and 25a), there were no other between-group differences in energetic arousal after the emotional computer task. Means and standard deviations for Energy scores are presented in Table 4.

Separate non-independent sample t-tests were conducted on the Energy dimension of arousal, to examine mean differences in self-reported arousal within groups, after processing emotional compared to neutral words. Results showed that, within groups, there were no significant differences in mean energetic arousal after the neutral word task, as compared to the level of energetic arousal reported after the emotional word task. This lack of difference in Energy was predicted for ASPs only (hypothesis 21a), so hypotheses 19a, 20a, and 22a were not supported. Again, although the absence of a difference in Energy in ASPs was predicted a priori, the result did not occur within the context of significant differences and therefore should be regarded with skepticism (Cortina & Folger, 1998).

To increase power for detecting expected interactions, a one-way ANCOVA with planned comparisons was conducted on arousal change data. This test was analogous to the data analysis for the reaction time change data. Again, no main effect for group was observed indicating that hypotheses 26a-29a were not supported.

Order effects for energetic arousal. A 4 (group) X 2 (word type) X 2 (form type) X 2 (order of task administration) ANCOVA was performed on Energy arousal data. Form type referred to whether the individual completed Form A of the AD ACL first or Form B first (regardless of whether the computer task contained emotional or neutral words). Order of task administration referred to whether the individual completed the computer task with neutral words first or the task with emotional words first. The analysis revealed a significant interaction between type of word task and the order of the task administration ($F(1, 235) = 9.371$, $p < .01$). For individuals who completed the emotional task first, there was an increase in energetic arousal after the emotional computer task ($M = 2.32$, $SD = .74$) compared to arousal following the neutral task ($M = 1.98$, $SD = .74$). However, for those who completed the neutral task first, there was a decrease in energetic arousal following the emotional word task ($M = 2.20$, $SD = .75$) compared to arousal following the neutral word task ($M = 1.96$, $SD = .82$). In other words, all individuals showed decreases in energetic arousal after the second computer task regardless of the word types used in the task. These results might indicate a habituation effect for performance of the task.

Order effects for tense arousal. A 4 (group) X 2 (word type) X 2 (form type) X 2 (order of task administration) ANCOVA was performed on tense arousal data. The results of this analysis showed that there were no main effects or interaction effects of the variables on Tension. For those who completed the neutral word task first, the mean Tension score was 1.69 ($SD = .66$) after the neutral task and 1.57 ($SD = .66$) after the emotional task. For those who completed the emotional word task first, the mean Tension score was 1.55 ($SD = .62$) after the neutral word task and 1.76 ($SD = .71$) after the emotional word task. Unlike the habituation effect that appeared to affect self-reports of energetic arousal, no order effects were observed for tense arousal.

Tense arousal. To compare differences between groups in mean tension after computer tasks involving emotional and neutral words, a 4 (group) X 2 (word type) ANCOVA was conducted. Arousal P scores were again used as a covariate. The results of this analysis were not significant, indicating that there were no group differences in the Tension dimension of arousal after the neutral task or after the emotional task (23b-25b). There was also no main effect for

word type, demonstrating that, regardless of group membership, (and despite predictions to the contrary) mean Tension levels did not differ after processing neutral words as compared to processing emotional words.

T-tests for paired samples were conducted on the Tension dimension of arousal, based on data collected from form A and form B of the AD ACL. By this method, mean differences in self-reported arousal within groups, after processing emotional compared to neutral words, were tested for significance. The means and standard deviations for the four groups on Tension arousal are displayed in Table 4. No groups showed significantly different levels of tense arousal after completing tasks containing different types of words demonstrating that hypotheses 19b-22b were not supported.

Finally, tense arousal change data was computed in a manner similar to that used to compute energetic arousal change data. A one-way ANCOVA was not significant, indicating that there were no group differences in tense arousal change from the neutral to emotional task (26b-29b).

Reaction Times to Positive, Negative, and Neutral Words

The previous analyses represent tests of specified hypotheses. In situations where hypotheses were not supported, it appeared that the lack of significance might be due to high within-group variance on the dependent variables. Therefore, finer grained analyses were subsequently performed to explore the potential for revealing a more systematic set of findings.

One tactic used to explore results more fully was to separate the group of emotional words into positive and negative groups to distinguish possible differences in reaction time based on emotional valance. For example, words such as “kiss”, “war”, “ghost”, “mourn”, “glee”, “loyal” would all be classified as emotional words in the previous analyses. However, in the current analysis, “kiss”, “glee”, and “loyal” were classified as positive, and “war”, “ghost”, and “mourn” were placed in the negative category. Specifically, a 4 (group) by 3 (word type – positive, negative, and neutral) ANCOVA was conducted to examine mean reaction time differences among the four groups, controlling for Arousal P scores. This analysis revealed a main effect for word type ($F(2, 353) = 4.47$, $p = .01$) with individuals in every group responding slower to negative than to neutral words, although no main effect for group was observed.

Mean reaction times to positive, negative, and neutral words can be viewed in Figure 3. Separate t-tests for paired samples showed that for controls and high-AIs , the mean reaction time to negative words was slower than the mean reaction time to positive words ($t(29) = 3.31$, $p < .01$) and ($t(29) = 3.1$, $p < .01$) respectively. The mean reaction time to negative compared to positive words was not significantly different for either the ASPs or the low-AIs. These findings were not predicted a priori and therefore should be interpreted with caution until subsequent research can replicate these findings.

Eysenck Personality Questionnaire (EPQ)

Four separate ANCOVAs with planned comparisons were conducted for mean scores on the Extroversion (E), Neuroticism (N), Psychoticism (P), and Lie (L) dimensions of the Eysenck Personality Questionnaire (EPQ). Scores on the Arousal P were used as the covariate. The analyses revealed significant group differences in extroversion ($F(4, 116) = 2.77$, $p < .05$) with ASPs scoring significantly higher than low-AIs (see Figure 4). Significant differences were also observed in neuroticism scores ($F(4, 116) = 11.70$, $p = .000$), such that controls and low-AIs scored significantly lower than both ASPs and high-AIs (see Figure 5).

In terms of psychoticism and the lie scale, the analyses again demonstrated the existence of group differences. Specifically, as would be expected, ASPs were significantly higher in psychoticism than were the controls ($F(4, 116) = 3.17$, $p < .05$) (see Figure 6). In addition, the analyses showed that groups differed significantly in lie scores ($F(4, 116) = 5.57$, $p = .000$), with ASPs scoring lower than controls, low-AIs, and high-AIs (see Figure 7). Given the ASPs' low social desirability, this result was also expected.

Debriefing

At the conclusion of the testing procedure, participants were asked whether or not they noticed a difference in the two computer tasks they just completed. Their responses were categorized into (a) yes, they noticed that words in one task were more emotional than words in the other, (b) no, they either did not notice any difference between the two tasks or they thought the tasks differed on another dimension, such as the speed of word presentation. A Chi-squared analysis was performed to examine group differences along this dimension. This analysis was not significant indicating that all groups noticed the word type manipulation in similar proportions. Forty-two percent of the sample noticed that some words were emotional while others were neutral and 55% of the sample did not notice this difference.

Analyses on Five Groups

Affect intensity. A main hypothesis in the current study was that ASPs would score low on the Affect Intensity Measure (AIM). As previously mentioned, although ASPs scored significantly lower than high-AIs, they also scored significantly higher than low-AIs. Because hypotheses were constructed under the assumption that ASPs would be low in affect intensity, lack of findings in previous analyses may have been due to the wide range of AIM scores in this group. Therefore, to investigate further, ASPs were divided into two groups: (a) those who scored low on the AIM and (b) those who scored high on the AIM.

The ASPs with the lowest and highest AIM scores were selected from the sample and are hereafter referred to as low-AI ASP ($n = 7$) and high-AI ASP ($n = 7$) groups. The sorting procedure was used to construct low-AI and high-AI ASP groups, whose AIM means did not differ significantly from the original high-AI and low-AI (non-ASP) groups, respectively. Seven participants per group was the maximum number of ASPs that could be selected in accordance with this criterion. It might also be noted that the low- and high-AI ASP group means did not differ significantly from each other on any of the pattern variables (i.e., socialization, social desirability, narcissism, or self-reported psychopathy) that were used to identify ASPs initially.

Participants to constitute new control, low-AI, and high-AI groups (all of $n = 7$) were randomly selected from the original groups (with replacement). Means and standard deviations for the five groups are presented in Table 5. An ANOVA now indicated a significant group effect on AIM scores ($F(4, 34) = 35.79$, $p = .000$). Duncan's multiple range tests verified that both low-AI ASPs and low-AIs had significantly lower AIM scores than did high-AI ASPs and high-AIs.

In the formally stated hypotheses, it was assumed that ASPs would consist of a homogenous group of individuals who were all low in affect intensity. Because this idea was not supported, it became necessary to examine only a subset of the sample of ASPs in order to adequately test the remaining hypotheses. Therefore, although the following analyses were not explicitly stated in the original hypothesis, they were implied at a conceptual level. In other words, the formal hypotheses referred only to ASPs and did not make predictions for low-AI ASPs and high-AI ASPs. However, one could simply replace the term "ASP" with the term

"low-AI ASP" in hypotheses 4-29b because, based on the first three hypotheses, it is clear that "ASP" is referring to a homogenous group of low-AI individuals. Therefore, although the originally stated hypotheses did not make explicit predictions about five experimental groups, the following analyses should not be considered purely exploratory in the traditional sense. Predictions about low-AI ASPs were made in advance of data collection and they follow logically from theories of psychopathy.

Stable trait arousability. When ASPs were not divided into two groups, they exhibited significantly higher arousability than did low-AIs (and they were not significantly different from high-AIs). Thus, the hypothesis that ASPs would be low in Arousal P was not supported. However, the analyses conducted after ASPs were separated into low- and high-AI groups yielded different findings. Mean Arousal P scores for the groups can be viewed in Figure 8.

A one-way ANOVA, conducted on Arousal P scores for the five groups, was significant ($F(4, 33) = 7.7$, $p = .000$). Primarily, this analysis was conducted to determine whether or not low-AI ASPs and high-AI ASPs reported any differences in tendencies to become aroused. Results from Duncan's multiple range tests showed that low-AI ASPs were significantly lower in arousability than were high-AI ASPs. This result indicated that ASPs who were low in AI could be differentiated from ASPs who were high in AI on variables relevant to psychopathy, such as arousability. The analyses also showed that, in accordance with hypothesis 6, low-AI ASPs were significantly lower in arousability than were high-AIs. In support of hypothesis 5, high-AIs scored significantly higher in arousability than low-AIs. However, results were not consistent with predictions made by hypothesis 4. Low-AI ASPs did not have significantly lower Arousal P scores than controls.

Reaction time data. It was formally hypothesized that ASPs would not demonstrate differences in mean reaction times to neutral compared to emotional word tasks. This prediction was based on information indicating that psychopaths' emotional deficits may prevent them from extracting as much information from emotional stimuli as non-psychopaths do (Williamson, Harpur, & Hare, 1991). In the former analyses, there was a main effect for word type with ASPs demonstrating the same slowing response to emotional compared to neutral words as did the other groups.

To investigate reaction time separately for low- and high-AI ASPs, a 5 (group) X 2 (word type) ANCOVA with planned comparisons was performed on the reaction time data, using Arousal P scores as the covariate. The results now revealed a significant main effect for group ($F(4, 67) = 3.63$, $p = .01$) such that high-AIs reacted significantly slower than low-AIs. Duncan's multiple range test revealed that high-AI ASPs reacted significantly slower to emotional words than to neutral words. In contrast, low-AI ASPs did not show significant reaction time differences between emotional and neutral words (data can be viewed in Figure 9). This finding, predicted by the psychopathy literature, was consistent with the original hypothesis (#9). When only ASPs who were low in AI were examined, they failed to differentiate between emotional and neutral words or to use emotional words as cues to alter their behavior.

Analyses on the five groups of $n = 7$ revealed that the control group's mean reaction time to neutral and emotional words did not significantly differ which failed to support hypothesis 7. The group of high-AIs reacted slower to emotional compared to neutral words ($t(6) = 2.24$, $p < .07$) which supports hypothesis 8. In accordance with hypothesis 10, the low-AI group did not show significant reaction time differences to emotional and neural words.

A one-way ANOVA examining group differences in mean reaction times during the neutral word task was not significant indicating that there were not between group differences on this variable. Therefore, hypothesis 14 was not supported. A separate one-way ANOVA examined group differences in mean reaction times during the emotional word task and again failed to find between group differences. This analysis failed to show support for hypotheses 11-13.

T-tests for paired samples were conducted on reaction time change data for the five experimental groups (data can be viewed in Figure 10). Results showed that the mean reaction time change from the neutral word task to the emotional word task was significantly greater for high-AI ASPs than for low-AI ASPs ($t(6) = 2.6$, $p < .05$). High-AI ASPs also had significantly greater reaction time change scores than low-AIs ($t(6) = 3.54$, $p = .01$).. This indicates that high-AI ASPs are reacting significantly more slowly to emotional, compared to neutral, words than are low-AI ASPs or low-AIs. It should be noted that these analyses were exploratory and are in need of replication. Contrary to predictions made by hypotheses 15-18, no other between group differences in mean change scores were found.

Energetic arousal. The initial analyses using four groups demonstrated that, after the emotional word task, ASPs were significantly lower in Energy than were the controls. In addition, ASPs in the previous analyses showed no change in energetic arousal from the neutral to the emotional word task. Finally, no group differences with regard to Energy were observed after the neutral word task.

To discover whether or not Energy levels after a neutral or emotional work task differed for low-AI ASPs and high-AI ASPs, additional analyses were performed on the five groups (data can be viewed in Figure 11). When a 5 (group) X 2 (word type) ANCOVA with planned comparisons was performed on the reaction time data, using Arousal P scores as the covariate, no significant effects were observed. These results indicated that there were no within group differences in energetic arousal after the neutral compared to the emotional word task (hypotheses 19a-22a). Predicted interaction effects between group and word types with regard to Energy arousal also were not supported (hypotheses 23a-25a).

To increase power through assessing a main effect rather than an interaction, change scores were computed, based on the individual's mean energetic arousal score in the emotional word condition minus his or her mean Energy level in the neutral word condition. From these individual change scores, a mean change score was then computed for each group.

Results from a one-way ANOVA with planned comparisons revealed a significant difference in the change in mean Energy scores between low-AI ASPs and high-AIs at the $p < .05$ level. As shown in Figure 11, high-AIs increased their reports of Energy after the emotional words, compared to self-reported Energy after the neutral words. In contrast, low-AI ASPs decreased their reports of energetic arousal after the emotional, compared to the neutral, word tasks. Duncan's multiple range test indicated that the mean change score for high-AIs was significantly greater (at the $p < .05$ level) than the mean change score for low-AI ASPs. This information is consistent with hypothesis 28a. Other predicted between group differences in mean Energy change scores were not supported (hypotheses 26a, 27a, and 29a).

Tense arousal. The former analyses on tense arousal demonstrated no group or word-type effects on the Tension dimension of arousal. Subsequent analyses were conducted on the five groups to discern whether or not low- and high-AI ASPs responded differently to questions about tense arousal. A one-way ANOVA ($F(4, 34) = 1.57$, $p = .20$) with planned comparisons revealed

that after the emotional word task, low-AI ASPs reported significantly lower levels of Tension than did high-AIs (at the $p < .05$ level). Further, as shown in Figure 12, low-AI ASPs reported decreased Tension after emotional words compared to the tension aroused by neutral words, whereas high-AIs reported increased Tension after emotional, compared to neutral, words. Although the mean Tension change scores were not significantly different between these two groups, this pattern is similar to the one described above for energetic arousal. No other between group differences in reports of Tension after emotional, compared to neutral, words were observed (hypotheses 23b-25b). T-test for paired samples indicated that there were no within group differences in reports of Tension after the neutral compared to the emotional word task which failed to support hypotheses 19b-22b.

A one-way ANOVA conducted on mean Tension change scores was not statistically significant. Contrary to hypotheses 26b-29b, there were no group differences in mean Tension change scores.

Eysenck Personality Questionnaire (EPQ). Four separate ANOVAs with planned comparisons were conducted for mean scores on the Extroversion (E), Neuroticism (N), Psychoticism (P), and Lie (L) dimensions of the EPQ for the five experimental groups. The analysis showed no significant group differences with regard to mean E scores. However, high-AI ASPs scored four points higher in E than low-AIs or controls. Given the low power in this analysis due to the low sample size, it is thought that this difference would be statistically significant with larger sample sizes. Separate one-way ANOVAs for mean P scores and mean L scores were not statistically significant for the five groups. Table 6 displays the means and standard deviations along the four dimensions of the EPQ for the five groups.

A one-way ANOVA on mean N scores was demonstrated significant group differences ($F(4, 34) = 6.18$, $p = .000$). Duncan's multiple range test with $p = .05$ showed that high-AI ASPs had significantly higher N scores than low-AIs, whereas, the N scores for the low-AI ASPs were not significantly different from the N scores for the low-AIs.

Discussion

Affect Intensity

One of the central hypotheses in this study was that, based on the literature pertaining to psychopaths and their shallow affect, ASPs would be low in affect intensity as measured by the Affect Intensity Measure (AIM). This hypothesis was not entirely supported. Although ASPs scored significantly lower than did the group of high-AIs, ASPs also scored significantly higher than did the group of low-AIs on the AIM. However, this study found that although ASPs displayed a wide range of affect intensity levels, two-thirds could be classified as low. It has been shown that psychopaths score lower on the AIM than do non-psychopaths ($t(1,38) = 2.45$, $p < .05$) (Day & Wong, 1996) which leads one to believe that this lack of finding in ASPs was not due to the poor discriminatory power of the AIM instrument. Therefore, it may be valid to say that some ASPs truly are high in affect intensity whereas others are low.

One could argue that ASPs may be deficient in their self-perceptions or abilities to report on personal affect intensity levels. It may be that if AI levels were measured by an alternate method that does not require direct self-reporting of personality, virtually all ASPs would exhibit low affect intensity. One way to examine this issue would be to have parents or close friends of the ASPs complete the AIM, with the participant as the target. This method was used in establishing the validity of the affect intensity construct; others' reports were found to correlate .5 with the self-report method (Larsen & Diener, 1985) in 80 undergraduate students. Although

Larsen and Diener interpreted this result as supporting the construct validity of the self-report measure, it might be noted that a correlation of .5 reflects only 25 percent shared variance between the two methods. With respect to ASPs specifically, if others agreed with ASPs' self-reports, there would be support for the present finding of a wide distribution of AIM scores for ASPs. However, if others disagreed with the self-reports and reported that even more than two-thirds of aberrant self-promoters were low in AI, further investigations into the affect intensity levels of ASPs would be warranted.

In general, people distort or bias the information used in their self-assessments in order to preserve self-esteem levels (Baumeister & Cains, 1992) or to maintain positive illusions about the self (Taylor & Brown, 1988). However, it is also true that self-perceptions are one of the primary determinants of future behaviors; furthermore, these future behaviors affect the type of situations a person actually encounters and thereby affects his or her cognitive interpretations of those situations (Blasovich, 1990). I believe that the data in this study, based on self-reports of the AIM, are useful in providing information about how ASPs perceive themselves. In turn, I believe that ASPs' self-reported perceptions are more accurately predictive of their interpretation of and responses to emotional and neutral stimuli than are others' reports. Nevertheless, obtaining a parent's or a close friend's understanding of the ASPs' affect intensity levels might help to clarify the discrepancy between ASPs' self-reports and reports obtained from clinical interviews, which typically find evidence of shallow affect in psychopaths (Fowles, 1980; Hare, 1978, 1993; Patrick, Cuthbert, & Lang, 1994).

Although some may feel that the findings of the present study indicate that ASPs may be deficient in their self-perceptions, it is assumed that any tendency they may have to distort information pertaining to the self is no greater than that exhibited by non-ASPs. This question was not specifically tested in this study; therefore, no definitive conclusions can be drawn. However, the study did find that ASPs scored significantly lower on the Lie scale of the EPQ than did non-ASP controls indicating that ASPs are less likely to try and "fake good" or be hypocritical. This suggests that ASPs are even less likely than controls to lie on a self-report measure of affect intensity.

Hypotheses for this study (4-29b) were formulated on the assumption that the mean AIM score for ASPs would be as low as the mean AIM score for low-AIs. Because this result was not observed, ASPs were divided into two groups: those who were high in AI and those who were low in AI. It may be that low-AI ASPs are similar to primary (low anxiety) psychopaths whereas high-AI ASPs are analogous to secondary (high anxiety and high neuroticism) psychopaths (Newman, Widom, & Nathan, 1985). There is some evidence that this is true. Examination of the scores from the neuroticism scale of the EPQ for the entire group of ASPs showed that ASPs were higher than controls and low-AIs. This analysis makes it appear that ASPs are neurotic. However, when ASPs were divided into low- and high-AI groups, Duncan's multiple range tests found that high-AI ASPs scored significantly higher than low-AIs at the $p < .05$ level. However, the neuroticism scores for low-AI ASPs were not significantly different from scores for low-AIs. Although neuroticism is not a direct measure of anxiety, the neuroticism scale of the EPQ assesses tendencies to worry and to become upset, both of which are conceptually related to anxiety.

The present study was designed to assess emotional deficits and perceptions of various dimensions of arousal in ASPs, assuming that all ASPs were similar to primary psychopaths. Future research would benefit from assessing ASPs' trait anxiety levels directly. Newman,

Widon, & Nathan (1985) have shown that psychopaths with low scores on the Welsh Anxiety Scale are worse at passive avoidance learning than are psychopaths with high trait anxiety levels, thus demonstrating that only low-anxious psychopaths display the behavioral characteristics traditionally associated with psychopathy. Newman et al., along with others (Lykken, 1957; 1995), maintain that "true " psychopaths are only those who are low in anxiety.

There is, however, some debate on this issue. For instance, Lilienfeld (1994) feels that the concept of anxiety has been confused with fearfulness. The idea is that although psychopaths may be low in fearfulness, they may experience state anxiety so frequently, due to their risk-taking activities, that their trait anxiety is actually elevated. Therefore, psychopaths may report high trait anxiety (as a consequence of their constant exposure to stressful life events) while maintaining low sensitivity to signals of upcoming threats (i.e. low fearfulness). These ideas lead one to speculate on the possibility that ASPs who are high in affect intensity or neuroticism may score high on such measures due to tendencies to engage in anxiety and emotion-provoking risky behaviors. Because the present study did not assess risky behaviors, this idea can not be examined in more depth.

In summary, it appears that ASPs, like psychopaths, should be divided into primary and secondary types. This is a significant contribution to the ASP literature in that previously, studies have classified ASPs according to scores on measures of narcissism, self-reported psychopathy, socialization, and social desirability. The present study demonstrates that a measure of anxiety should be included in the cluster analysis to eliminate from study, those individuals who show the ASP pattern across the four clustering variables but are high in anxiety. This will result in a narrowing of the potential pool of ASPs and will allow for more precise comparisons between ASPs and primary psychopaths on variables of interest.

Arousability

Results from this study find that, in accordance with Larsen and Diener's (1987) hypotheses, low-AIs are significantly lower than high-AIs in terms of arousability. In other words, high-AIs report that they startle easily, become easily frustrated and excited, and that their strong emotions carry over for long periods of time. It is generally accepted that with many emotions, perceptions of high arousal accompany the experience of the emotion, so it is not surprising that individuals high in affect intensity would also report high levels of arousability, measured here as the tendency to become aroused (Coren, 1988). Therefore, Larsen and Diener's ideas are supported in that, if high-AIs generally perceive themselves to be low in baseline arousal (i.e., they generally think of themselves as calm, quiet, and not excited), they may use emotion-provoking situations to increase their emotional perception. Thus, they would experience a situation-provoked emotion quite intensely (leading to high scores on measures of affect intensity) and report that they have a tendency to become easily aroused. The converse would be true for low-AIs. If low-AIs perceive themselves to be in a general state of high arousal, they might, as a compensatory mechanism, experience emotions quite shallowly in emotional situations. Thus, they would report low affect intensity and low arousability.

ASPs in this study were similar to high-AIs in that they reported high arousability levels. At first glance, it is surprising, then, that ASPs were higher than controls in arousability. Nevertheless, if it is true (based on Hare's contentions regarding psychopaths, 1993) that ASPs continually perceive a state of low arousal in themselves, they may adapt to this state by developing a tendency to become easily and quickly aroused by situations that do not make

non-ASPs feel restless, stirred up, or startled. It may be that the typical interview experience with an ASP (e.g., Gustafson & Ritzer, 1995) is not emotion-provoking (in the sense of "startling" or "arousing"), and so the interviewer only sees the low arousal, shallow affect characteristics of the ASP. Given a potentially arousing or emotion-provoking situation, however, high arousability characteristics may become more evident to observers as is the case, for example, in situations that provoke ASPs' loss of behavioral control.

These ideas were clarified when ASPs were divided into low- and high-AI groups. ASPs who were low in AI reported levels of arousability similar to those reported by low-AIs (non-ASPS) (both were low). If the same line of reasoning is applied to ASPs, low-AI ASPs experience high levels of arousal and develop mechanisms to remain quiet and calm (in an attempt to achieve a homeostatic level), a process which leads to reports of low arousability. This idea is in direct opposition to Hare's (1993) view of "true" psychopaths as individuals who experience generally low levels of arousal. Instead, this study illustrates that low-AI ASPs report low tendencies to become aroused. Determinations of baseline or resting levels of arousal can not be made based on the present data.

In summary, high-AI ASPs and high-AIs (non-ASPs) both reported high levels of arousability, indicating that individuals who experience emotions intensely also are easily aroused. However, at this point it is unclear whether or not individuals high in affect intensity experience low general arousal as predicted by Larsen and Diener (1987). As previously discussed, general arousal is not term that is useful in distinguishing between individuals. Rather, what has been shown is that high levels of affect intensity coincide with high levels of arousability and low levels of affect intensity coincide with low levels of arousability.

Reaction Time Data

The reaction time (RT) data in the present study indicated that although there was no main effect for group, there was a main effect for type of word task. Across all groups, responses were slower during the task containing emotional words than during the task containing neutral words. Although previously published research using the lexical decision task had found that non-psychopaths responded faster to emotional than to neutral words (Williamson, Harpur, & Hare, 1991), the non-ASPs in the present study displayed the opposite pattern.

Williamson et al., (1991) contend that, for non-psychopaths, emotional words are more arousing than neutral words and thus elicit faster reaction times. They suggest that psychopaths do not show a response time facilitation to emotional words because emotional words mean no more to them than neutral words do. This information, combined with evoked response potential data, led the researchers to conclude that psychopaths fail to differentiate between affective and non-affective stimuli. However, a closer examination of their results reveals that, not only do psychopaths not show a response time facilitation to emotional words, they were actually slower to respond to emotional words than to neutral words. In fact, psychopaths were slowest to respond to negative words, followed by positive words, and finally neutral words. Because these results were not expected at the time of the Williamson et al. study, no analyses were conducted to test the differences statistically (Moreover, no published record of the statistical analysis for these data currently exists). This RT pattern for psychopaths in the Williamson et al. study was the same as that observed for both the ASPs and the non-ASPs in the present investigation. In other words, the results from the present study concerning ASPs replicate the finding for psychopaths in the Williamson et al. study. However, controls, low-AIs and high-AIs in the present research also showed a slower RT to emotional than to neutral words, a result that is

inconsistent with the former study. Other new research also supports the current findings regarding ASPs. A study using juvenile delinquents who scored high on factors related to psychopathy has found that responses during a lexical decision task are slower to emotional words than to neutral words (Loney, personal communication, February 2, 1999).

To explore these findings further, mean reaction times were calculated separately for positive and negative words. Results showed that ASPs and low-AIs manifested no significant differences in reaction times to positive and negative words. Only the control group and the group of high-AIs showed significantly slower reaction times to negative words than to positive. This finding indicates ASPs' similarity to low-AIs, in that neither group acknowledged a difference between negative and positive verbal stimuli, at least to the extent that their reaction times were affected.

It is possible that this finding is related to the cognitive processing deficits and low arousability in low-AI ASPs and low-AIs. It has been shown that low-AIs do not relate positive and negative information in terms of themselves while viewing slides depicting pleasant and unpleasant scenes, nor do they pay attention to emotional components of slides (Larsen, Diener, & Cropanzo, 1987). Therefore, low-AIs may fail to differentiate between positive and negative verbal stimuli because of their failure to pay attention to the distinctions between emotional cues in the environment. Such cues are not used by low-AIs to alter the intensity of their emotional responses and so distinctions between positive and negative dimensions of these cues would be unnecessary. ASPs may fail to differentiate between positive and negative words for similar reasons. In support of this idea, it has previously been shown that psychopaths may interpret both positive and negative stimuli in terms of approach responses. For instance, Patrick, Bradley, and Lang (1993) found that psychopaths gave similarly small startle responses while watching either pleasant or unpleasant slides.

Controls in the present study indicated that they noticed a difference between positive and negative words by their differential reactions. In contrast, ASPs responded with the same speed to positive and negative words. When ASPs were divided into low- and high-AI groups, analyses again indicated that ASPs, regardless of affect intensity level, did not show different reaction times to positive than to negative words. Furthermore, although high-AI ASPs responded like all other groups (they were slower to respond to emotional compared to neutral words), low-AI ASPs did not show this pattern. Low-AI ASPs did not have significantly different reaction times to emotional vs. neutral words. This finding indicates that when ASPs, as they were initially conceptualized, are examined, they fail to differentiate between emotional and neutral words.

The reaction time data seem to demonstrate differences in the cognitive functioning of ASPs and non-ASPs which then leads to differences in emotional responding and perceptions of arousal. This interpretation is in accordance with Lazarus' (1984, 1998) contention that some form of cognitive functioning must occur before the occurrence of an emotional response. In fact, it is stated in Murphy and Zajonc (1993) that emotionally valanced words should not be used in studies examining affective vs. cognitive primacy because words may be stimuli that require semantic or cognitive processing before they instigate an affective process (unlike stimuli such as facial configurations).

The reaction time data collected in this study are, in part, supported by previous research. Day and Wong (1996) conducted a study using a similar lexical decision task and found reaction time differences between psychopaths and non-psychopaths while processing emotional words.

Based on assumptions that the left hemisphere processes the denotative aspects of language by way of a verbal-analytic tactic and the right hemisphere processes the connotative aspects of language (Borod, 1992; Brownell, 1988), Day and Wong proposed that psychopaths would fail to show a right hemisphere advantage for negative stimuli. They hypothesized that psychopaths, due to their callousness, shallow affect, and fear deficit or emotional deficit, would rely more on left hemisphere decoding strategies even when processing emotional words.

Although Day and Wong's (1996) study differed from the present one in that Day and Wong used only negative and neutral words and presented the words tachistoscopically, parallels can be drawn. Day and Wong presented each of 20 psychopaths and 20 non-psychopaths with an emotional and a neutral word; the stimuli were presented simultaneously on a computer screen. The participant was required, as quickly and accurately as possible, to indicate whether the emotional word was presented on the left or right side of the screen. Results showed that though non-psychopaths exhibited a left visual field (LVF) (or right hemisphere) advantage (RTs were faster when the emotional word was presented in the LVF), psychopaths failed to show such an advantage. In fact, psychopaths were slower to respond when the emotional word was presented in the LVF. When the same procedure was repeated with pictures of negative and neutral faces, Day and Wong observed only a main effect for visual field, such that all respondents reacted faster when emotional faces were presented in the LVF. These results lead Day and Wong to infer that the psychopath's deficit in processing emotional stimuli may be limited to linguistic material. Psychopaths, they concluded, show less lateralized performance than do non-psychopaths when processing emotional words, suggesting that qualities non-psychopaths notice and decode in the right hemisphere are less salient to the psychopath.

However, if data from the Day and Wong (1996) study are collapsed across visual field, psychopaths are seen to react slower ($\underline{m}$ ~ 665ms) to the negative words than do non-psychopaths ($\underline{m}$ ~ 585ms). Similarly, the current study, which was not designed to assess visual field effects, found that ASPs were also slightly slower (although not significantly) in responding to negative words ($\underline{m}$ = 812ms) than were controls ($\underline{m}$ = 780ms) or low-AIs ($\underline{m}$ = 743ms). This finding supports the idea that ASPs may be a group who show the same pattern of deficits in responding to linguistic stimuli as psychopaths do, albeit a lesser degree is exhibited among ASPs.

At this point, it is unclear why the controls in the study would respond more slowly to emotional than neutral words. Theoretically, emotional words would activate the emotional response network but neutral words would not (Lang, 1979). Therefore, emotional words, due to their association with behavioral acts and physiological mobilization, would lead to increases in perceptions of arousal. Because reaction time increases are traditionally thought to indicate increases in bodily activation, reaction times should be faster to emotional than to neutral words. The reason for the finding of an opposite pattern of results can only be speculated upon. Perhaps the emotional words elicited a withdrawal response due to their associations with positive and negative life events. This might lead to a pausing before the response was made and thus a slower mean reaction time. This interpretation would support classic literature regarding the concept of perceptual defense. Perceptual defense was thought to be the manifestation of a defense process that occurred in situations where the individual felt threatened or insecure (Lazarus, 1954). This psychological defense mechanism presumably worked to reduce the affective disturbance of such a threat and could be studied in research that required participants to perceive, learn, or recall threatening material (Eriksen & Lazarus, 1952). In the current study,

it could be argued that there are individual differences in tendencies to reject or avoid seeing "taboo" words that could be related to emotional disturbances.

Future research would benefit from examining reactions to positive words separately from negative words. Presumably, negative words would elicit greater retreat behaviors and greater degrees of response time slowing than positive words which may actually elicit approach responses and response time facilitation in controls (as found in the Williamson, Harpur, and Hare , (1991) study).

Energy Arousal Data

Self reports of energetic arousal were taken after participants completed the lexical decision task containing neutral words and again after participants completed the lexical decision task containing emotional words. Results showed that no groups reported significant changes in the Energy dimension from one task to the other, thus suggesting that the manipulation of task type was not powerful enough to evoke changes in perceptions of energetic arousal for any participants in the study, regardless of personality type. This lack of finding may be due to the transitory nature of perceptions of Energy. As stated above, the reaction time data indicated that participants did differentiate between the two tasks: all groups reacted faster to neutral words than to emotional words. The difference between the reaction time and the energetic arousal results may have been due to the timing of their recording. Reaction times were measured on-line and can be considered a more direct measure of experience during the two types of tasks. The energetic arousal measure, on the other hand, was a self-report procedure which took approximately two minutes to complete. Although the questionnaire was distributed immediately after the computer task, enough time may have elapsed for changes in Energy to have dissipated.

Although data show that the type of word task did not lead to differentiated perceptions of energetic arousal within any group, between-group differences were nonetheless observed. ASPs, after the emotional word task, reported significantly less energetic arousal than did controls, even though ASPs and controls did not differ in perceptions of Energy after the neutral task. This information is consistent with data indicating that there may be no differences in terms of baseline arousal levels between introverts and extroverts, but, rather, there may only be differences in groups' arousal levels after stimulation (Gale, 1981). In terms of the present study, the neutral word task can be considered non- (or just mildly) stimulating while on the contrary the task presenting emotional words was designed to activate the emotional response network. It was thought that emotional words, having been previously associated with emotional situations and/or experiences, would activate the body in a way that would prepare the subject for the possibility of such a situation or experience. Lang's (1979) theory of emotional experiences is based on basic principles of classical conditioning. Emotional words can be viewed as conditioned stimuli that evoke a conditioned emotional response. Although this study was not attempting to induce specific emotions, it was attempting to induce reactions, such as feelings of energetic or tense arousal, that prepare the organism for such emotions.

The energetic arousal data from this study illustrate the shallow affect in ASPs. ASPs did not use emotional words as cues to raise levels of energetic arousal though controls did. Controls showed higher levels of Energy after processing the emotional words than ASPs, thus indicating their recognition of the emotional words as cues for possible future emotional experiences. It appears that ASPs do not make such an association, thus indicating that they extract less information from emotional stimuli than do controls. This finding is consistent with the results

from Williamson, Harpur, and Hare (1991), who found evidence that psychopaths do not extract the same amount of information from emotional words than do non-psychopaths.

Hypotheses concerning low- and high-AIs' Energy scores generally were not supported. Low- and high-AIs did not differ in energetic arousal after the neutral task which is not consistent with Larsen and Diener's (1987) theory regarding baseline arousal level differences between the groups. In addition, the groups did not differ in perceptions of Energy after the emotional task. Thus, it would seems that low- and high-AIs did not differentially process emotional stimuli as Larsen and Diener would have predicted. This conclusion is supported by the reaction time data previously discussed. The RT data further demonstrated that both the low- and high-AI groups reacted slower to emotional compared to neutral words; Larsen and Diener would have predicted low AIs to react no faster or slower to emotional than to neutral words and high-AIs to react slower. Perhaps emotional words generated more interest for both groups and therefore elicited longer looking times than did neutral words. Regardless of the cause of this phenomenon, the results from the current analyses do not support the idea that low- and high-AIs cognitively interpret emotional stimuli differently and use these cognitions to experience either more intense or more shallow emotions which, in turn, would regulate internal arousal levels.

This interpretation is only tentative, however, because when analyses were conducted on the five-group data, high-AIs reported increased Energy levels after the emotional words whereas low-AI ASPs reported decreased Energy levels after the emotional words. Combining the groups washed out this difference; nevertheless, the trend observed among the ASPs (when they were low in AI), supported Larsen and Diener's theory. It is interesting to note that adding the characteristic of aberrant self-promotion to the low affect intensity trait, enhanced the changes in Energy following the processing of neutral and emotional words so that the change score was significantly different from that displayed by low-AIs.

Tense Arousal Data

Contrary to hypotheses, groups did not differ in reports of tense arousal depending on the type of words in the lexical decision task. Although ASPs were not expected to use emotional words as signals to regulate self-perceptions, it was expected that controls, low-AIs, and high-AIs would recognize emotional words as different from neutral ones and would therefore differentially regulate self-perceptions of tense arousal.

There is some evidence to suggest that individual differences in affect intensity may be due to differences in cognitive interpretations of situations and stimuli (Larsen, Diener, & Cropanzo, 1987; Dritschel & Teasdale, 1991). It has been shown that high-AIs engage in more personalization and more overgeneralizations than those low in AI and that these cognitive distortions may be a method by which high-AIs raise their generally low arousal levels. The results from this study are not entirely consistent with this rationale. It still may be possible, however, that high and low-AIs engage in different types of cognitive operations to emotional and neutral stimuli. This study assessed perceptions of arousal immediately following the processing of tasks. As discussed previously with regard to Energy, transitory changes in tense arousal may fade before self-reports can be completed.

Analyses of the tense arousal data were also conducted with ASPs divided into high- and low-AI groups. The results were similar to the results yielded by the energetic arousal data. Low-AI ASPs showed lower levels of Tension after the emotional words that did high-AI (non-ASPs). This finding again demonstrated that if only ASPs who were low in AI were considered, they fulfilled predictions made by Larsen and Diener (1987) regarding individuals with low

affect intensity. These ASPs reported decreased tense arousal after emotional words whereas high-AIs reported increased tense arousal. Consistent with the result concerning energetic arousal, the slight change in Tension for low-AIs was not significant; however, when aberrant self-promotion accompanied low affect intensity, a significant decrease in Tension was observed.

In summary, for both the Energy and Tension dimensions of arousal, low-AI ASPs showed decreases and high-AIs showed increases after the emotional words. In accordance with Larsen and Diener's theory this indicates that high-AIs use emotional stimuli as cues to increase their arousal levels, perhaps due to perceptions of low levels of these types of arousal during resting periods. Low-AIs (when combined with aberrant self-promotion) use emotional words to indicate a lowering of arousal perhaps to maintain or lower their already high arousal at some optimal point. Although Hare's theory that low affect intensity psychopaths would have low arousal was not supported, this information can be taken as further evidence for the shallow affect in ASPs.

Eysenck Personality Questionnaire

Extroversion and Neuroticism. According to Eysenck and Eysenck (1975), one of the three main dimensions of personality is Extroversion-Introversion. The extrovert is characterized by high levels of activity and socialization. In contrast, the introvert is more distant, introspective, passive, and quiet. A second dimension of personality, known as Neuroticism, refers to the stability versus instability of the individual's emotionality. A highly neurotic individual is said to be emotionally unstable, moody, or touchy, whereas the person low in neuroticism is said to be emotionally stable, calm, and high in leadership.

Further evidence suggests that extroversion is related to high levels of positive affect whereas neuroticism is related to high levels of negative affect (Costa & McCrae, 1980; Diener & Emmons, 1984; Watson, 1988). The idea is that the personality trait of extroversion promotes positive emotions; in contrast, due to the worry and anxiety involved with neuroticism, this trait promotes negative emotionality.

McCrae and Costa's (1991) understanding of the relationship between personality and affect is theoretically grounded in the work of Gray (1981; 1987), who posits that extroverts are highly sensitive to signals of reward (a strong BAS) whereas neurotics are sensitive to signals of punishment (a strong BIS). Based on this information, other researchers hypothesized that the underlying cause of differences in positive and negative affect tendencies are differential sensitivity levels to signals of reward and punishment. In testing these hypotheses experimentally, Larsen and Ketelaar (1991) found that highly neurotic subjects were more emotionally reactive after a negative mood induction than were emotionally stable subjects. In contrast, extroverts were more emotionally reactive after the positive mood induction than were introverts. In other words, the strength of the positive affect induction procedure was better predicted by extroversion scores whereas the negative affect induction procedure was better predicted by neuroticism scores.

Based on this research, it would be expected that ASPs, who, like psychopaths, might suffer from a weak BIS (or a strong BAS), would score high in extroversion and low in neuroticism. Some support was found for the former prediction, but not for the latter. Specifically ASPs were higher in extroversion than were low-AIs and Controls (although this difference was significant at only a $p = .07$ level); however, contrary to the idea that ASPs might suffer from a weak BIS, the study found that ASPs were significantly higher in neuroticism than either controls or low-AIs. As previously stated, this should indicate the presence of a strong

BIS. On the whole then, the present data suggest that ASPs may possess a strong BAS and a strong BIS simultaneously because they are high in both extroversion and neuroticism. However, when ASPs were divided into low- and high-AI groups, a different pattern of findings emerged. Low-AI ASPs were, like primary psychopaths, low in neuroticism. This would indicate that low-AI ASPs, like psychopaths, may suffer from a weak BIS

The BIS is said to inhibit behavior that leads to punishment or lack of reward. It is a system that restrains movement toward goals that may have painful outcomes (Gray, 1987). Higher BIS activation should be seen in personalities characterized by a proneness to anxiety (Carver, & White, 1994). The BIS system is made up of the septo-hippocampal system (SHS), afferents from the brainstem, and projections to the frontal lobe which, in part, control the expression of anxious feelings (Gray, 1990). Although anxiety was not explicitly measured in the current study, individuals' neuroticism levels were assessed via the EPQ. Eysenck (1975) characterizes the neurotic personality as one who is typically anxious, moody, and in a state of worry. The individual high in neuroticism is said to become overly emotional and aroused in situations. The finding that high-AI ASPs scored higher than controls on measures of neuroticism implies a high functioning BIS and not a deficit, whereas, low-AI ASPs' low neuroticism scores indicate a deficient BIS.

These findings support the idea that only low-AI ASPs show characteristics similar to what has been found for psychopaths. For instance, research has consistently demonstrated that psychopaths lack behavioral inhibition skills which makes them less able to learn passive avoidance techniques in situations where failing to respond results in reinforcement (or lack of punishment) and responding results in punishment (or lack of reward) (Newman, Patterson, Howland, & Nichols, 1990). Findings such as these have been interpreted in terms of the weak anxiety levels and the weak BIS in psychopaths.

Psychoticism. The Psychoticism (P) scale of the EPQ has been accepted as the third major dimension of personality (Eysenck & Eysenck, 1975). A person who scores high on this dimension is said to be someone who is troublesome, lacks feeling and empathy, disregards danger, is aggressive and hostile, and is insensitive to the needs of others. Therefore, one would expect ASPs to be high in psychoticism. Data showed support for this prediction; ASPs were significantly higher than either controls or low-AIs.

Lie. The Lie scale of the EPQ measures participant's tendencies to "fake good". The scale measures a stable personality factor that is related to being socially naïve or hypocritical. As would be expected from their low concern with making socially desirable impressions, ASPs scored significantly lower on the Lie scale than did controls, low-AIs, or high-AIs. This demonstrates that ASPs, in this study, were not concerned with making positive impressions. They did not alter their attitudes and responses in these conditions of low motivation to create a more positive appearance. Although aberrant self-promoters, like psychopaths, will lie in the service of personal gain (Gustafson & Ritzer, 1995; Russell, 1996), the procedure in the current study did not appear to invoke such motivations.

Conclusions

The concept of arousal has played an important part in theories of psychopathy. At present, the concept of a unidimensional, general form of arousal is no longer accepted. This form of arousal theory was useful in years past and was instrumental in formulating classic theories such as Eysenck's (1964) theory of introversion/extraversion, theories of criminality, and Hare's (1970) initial theory of psychopathy. Since the 1970's, the general arousal concept has

been criticized and not supported through research; over the years, the theory has evolved to its current state, which conceptualizes arousal as a multidimensional construct. This new view states that arousal involves not only the ARAS and/or limbic structures as older theories presumed, but also the septo-hippocampal system (SHS) (Gray, 1970). Gray originally, discussed the role of the SHS in an organisms' sensitivity to punishment cues and has more recently shifted toward highlighting the involvement of the SHS in behavioral inhibition and feelings of anxiety (Gray, 1982; 1987).

Fowles (1980) elaborated on Gray's model and applied it to psychopathy. He proposed a "three-arousal model" composed of a behavioral activation system (BAS), behavioral inhibition system (BIS), and a nonspecific or general arousal system (NAS). The BAS is sensitive to rewards and is said to initiate goal directed activity by increasing the activity in the NAS. The BIS is sensitive to punishments or non-rewards and inhibits ongoing activity by increasing the activity in the NAS. The NAS increases the intensity and the speed of the behavioral output of the two systems.

Fowles (1980) states that psychopaths have a weak BIS and therefore have difficulty monitoring their environment and detecting potential threats. If threats are not detected, corresponding increases in arousal do not occur indicating that rapid cognitive processing and/or behavioral modifications are not as likely. A weak BIS implies that the psychopath will engage in less stimulus processing, will be less likely to interrupt ongoing behavior, and will experience less fear arousal even when punishment cues are detected.

Perhaps it is not surprising that the current study did not find group differences in energetic and tense arousal after a neutral or emotional lexical decision task. Although two types of arousal were examined via self-report, the task was not specifically designed to activate the BIS subsystem of arousal. Although it was not the purpose if the study to directly test BIS deficits in ASPs, if a task was used that activated the BIS in normal individuals, group differences may have been evident in perceptions of energetic and tense arousal. For example, if the task was similar to that described by Newman and Kosson (1986) and required the participant to occasionally inhibit a response or be punished for responding, the BIS would be activated in normal individuals. In this type of task, the BIS would activate the general arousal system and increase feelings of anxiety. If the BIS is the system of arousal proposed to be deficient in psychopaths (Newman & Wallace, 1993), it follows that group differences between ASPs and controls may only be apparent following a task that specifically activates this system.

The current study was conducted under the assumption that because emotional words are associated with emotional experiences, the processing of such words would lead to higher levels of perceptions of certain types of arousal than the processing of neutral words which have no such connections (Lang, 1979). It was thought that by examining only perceptions of arousal and further dividing the concept into various types, the study was accounting for the multidimensionality of arousal. Upon closer examination however, it appears that perhaps certain aspects of the three-arousal system (Fowles, 1980) should have been induced by the task. Psychopaths (and by association, ASPs) are said to have a deficiency in the BIS, so a task requiring passive avoidance (not responding in the face of impending punishment or omission of reward) or an approach/avoidance conflict may have been more fitting. Instead, the task seemed to involve only the BAS, if we can assume that answering correctly was rewarding to the individual.

In summary, this study was beneficial in that new knowledge was gained about the functioning of ASPs. First, although all ASPs did not report shallow affect, a greater proportion of ASPs were found to be low in affect intensity than high in affect intensity. Future ASP research would benefit from utilizing this information and eliminating from study those ASPs who are high in AI. In addition, it would be advisable for future researchers to investigate the characteristic of shallow affect in ASPs by methods other than self-report. Although the creator of the AIM (Larsen, 1984) claims that the AIM assesses the intensity of typical emotional experiences un-confounded with the frequency with which emotions are felt, close examination of the items on the AIM leads one to question this assertion. For example, items such as "I get overly enthusiastic" and "My friends might say I'm emotional" might be interpreted by a respondent as referring to the frequency of enthusiastic or emotional experiences as opposed to the intensity.

The study also showed that low-AI ASPs were similar to low-AIs in several key ways. For instance, both groups were low in arousability as measured by the Arousal P scale. Furthermore, both low-AI ASPs and low-AIs failed to show reaction time changes to negative and positive words whereas controls and high-AIs reacted more slowly to negative words. This lack of reaction time change for the two groups also was observed in analyses regarding RTs to neutral compared to emotional words, thus demonstrating the similarity of low-AI ASPs and low-AIs in terms of arousability and reaction times. These findings are consistent with initial predictions regarding the two groups. What this illustrates is that, although it has been said that low-AIs experience high baseline levels of arousal and ASPs experience low baseline levels of arousal, both groups in the current study actually show <u>similar</u> patterns of arousability. Both groups are low in arousability as assessed by both a self-report method (Arousal P scores) and an on-line behavioral response (RTs during neutral and emotional word processing).

Moreover, the arousability and reaction time data support Larsen and Diener's (1987) theory regarding high-AIs. High-AIs increased reaction times to emotional words as the theory would predict; however, the finding that low-AIs also increased their reaction times is problematic and does not support the theory. High-AIs also showed high levels of energetic and tense arousal after emotional words. These finding support the idea that high-AIs use emotional situations to raise their perceptions of arousal to a level they perceive as optimal.

In this study, it was initially assumed that emotional words would be more arousing than neutral words for controls and high-AIs. The data instead seem to indicate that the emotional words captured the attention of certain participants and were more interesting, resulting in longer looking times before responses were made. Based on reaction time data then, low-AI ASPs appear to pay no more attention to emotional words than they do to neutral ones. In addition, they are no more interested in negative than in positive words. Therefore, conclusions about Hare's (1933) theory regarding low cortical arousal in psychopaths can not be adequately drawn based on the present data. At this point, nothing definitive can be said about any groups' baseline levels of arousal because such levels were not directly assessed. Future research would benefit from taking self-perceived arousal levels while the individuals were at rest. Nevertheless, support for the idea that ASPs are low in arousal was found when scores on the EPQ were examined. ASPs were high in extroversion, which has been consistently related to low baseline levels of arousal (Eysenck, 1975) and low-AI ASPs were low in neuroticism, indicating their stable mood and low anxiety.

In conclusion, the results of this study are consistent with the possibility that ASPs, like psychopaths, may process emotional words in a manner that is similar to the way they process neutral words. Future research should concentrate on examining whether ASPs, like psychopaths, are less lateralized for language. Research also needs to address whether the shallow affect characteristic in ASPs is more apparent in negative or in positive emotions and whether or not others perceive positive and negative emotions to be very shallow in ASPs. In addition, at this point, it is unclear whether the shallow affect characteristic in low-AI ASPs (and psychopaths) is due to an information processing or receptive disorder or whether it would be better characterized as an emotional production problem. Although the reaction time data from this study are consistent with the idea that low-AI ASPs do not glean as much information from emotional stimuli as non-ASPs, the lack of differences in reports of Energy or Tension may simply be due to emotional production issues. Finally, although the study addresses issues of arousal after neutral versus emotional word processing, the interpretations of the findings are limited to discussions involving only perceptions of energetic and tense arousal. It should be remembered that very different patterns of finding could have been obtained if other aspects of perceived arousal, patterns of ANS activity, or patterns of EEG activity had been examined. It remains to be seen then, what results will be found when different types of arousal are examined.

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Table 1.

Means and Standard Deviations on Personality Measures for the Full Sample, ASPs, and Controls

	Full Sample (n = 457)		ASP (n = 30)		Control (n = 30)	
Scale	M	SD	M	SD	M	SD
CPI	35.81	5.87	28.38	6.2	38.20	7.81
SD	4.32	1.92	2.57	.96	4.86	1.62
SRP	175.83	19.37	193.66	36.14	159.84	29.22
NPI	14.55	7.42	22.32	5.18	8.97	3.05

Note. CPI = Socialization subscale of the California Personality Inventory; SD = Marlowe-Crowne Social Desirability Scale; SRP = Self-Report of Psychopathy; NPI = Narcissistic Personality Inventory.

Table 2

Means and Standard Deviations for AIM scores and Arousal P Scores for the Four Groups

	AIM		Arousal P	
	Mean	SD	Mean	SD
	Low-AIs vs. High-AIs[a]			
Low-AI	**2.20**	**.38**	**18.30**	**4.45**
High-AI	3.58*	.26	28.20*	7.04
	ASPs vs. Others[b]			
ASP	**2.88**	**.61**	**26.61**	**6.45**
Control	2.93	.37	23.10*	5.96
Low-AI	2.20*	.38	18.30*	4.45
High-AI	3.58*	.26	28.20	7.04

Note. [a]Asterisks denote significant difference at $p < .05$ between high-AIs and low-AIs on AIM or arousability scores.

[b]Asterisks denote significant difference at $p < .05$ between comparison group and ASP group on AIM or arousability scores.

Table 3

Means and Standard Deviations for Accuracy Scores during the Emotional and Neutral Word Tasks for the Four Groups

Group	Neutral Word Task		Emotional Word Task	
	Mean	SD	Mean	SD
ASP	39.1	1.5	38.2	2.1
Control	39.1	1.1	38.9	1.3
Low-AI	38.8	1.4	38.6	1.5
High-AI	38.9	1.3	38.7	1.7

Table 4

Means and Standard Deviations for Reports of Energetic and Tense arousal after the Both the Neutral and Emotional Word Tasks for the Four Groups

	Energetic				Tense			
	Emotional		Neutral		Emotional		Neutral	
Group	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ASP	1.88	.74	1.88	.72	1.68	.68	1.62	.60
Control	2.22	.75	2.40	.74	1.61	.65	1.56	.69
Low-AI	2.18	.73	2.06	.82	1.54	.51	1.71	.73
High-AI	2.08	.77	2.22	.85	1.65	.72	1.76	.75

Table 5

Means and Standard Deviations for AIM scores for the Five Groups

	AIM		Comparison Group				
	Mean	SD	1	2	3	4	5
1) Low-AI ASP	2.21	.26		*	*		*
2) High-AI ASP	3.75	.42	*		*	*	
3) Control	2.83	.35		*			*
4) Low-AI	2.16	.26		*	*		*
5) High-AI	3.60	.34	*		*	*	

Note* Asterisks indicate a statistically significant difference between a group and the comparison group at the $p < .05$ level.

Table 6

Means and Standard Deviations Along the Four Dimension of the EPQ for the Five Groups

Group N = 7	Extroversion		Neuroticism		Psychoticism		Lie	
	M	SD	M	SD	M	SD	M	SD
Low-AI ASP	16.43	4.58	10.89	2.19	6.29	3.45	3.43	4.24
High-AI ASP	18.43	1.81	13.29	3.95	5.43	2.29	4.57	4.43
Control	14.29	4.19	11.29	3.82	3.14	1.35	7.86	3.63
Low-AI	14.29	4.75	7.57	3.82	4.43	2.57	8.57	3.60
High-AI	15.57	4.76	15.89	1.95	5.71	4.99	6.57	4.35

Figure Caption

Figure 1. Distribution of AIM scores for four experimental groups.

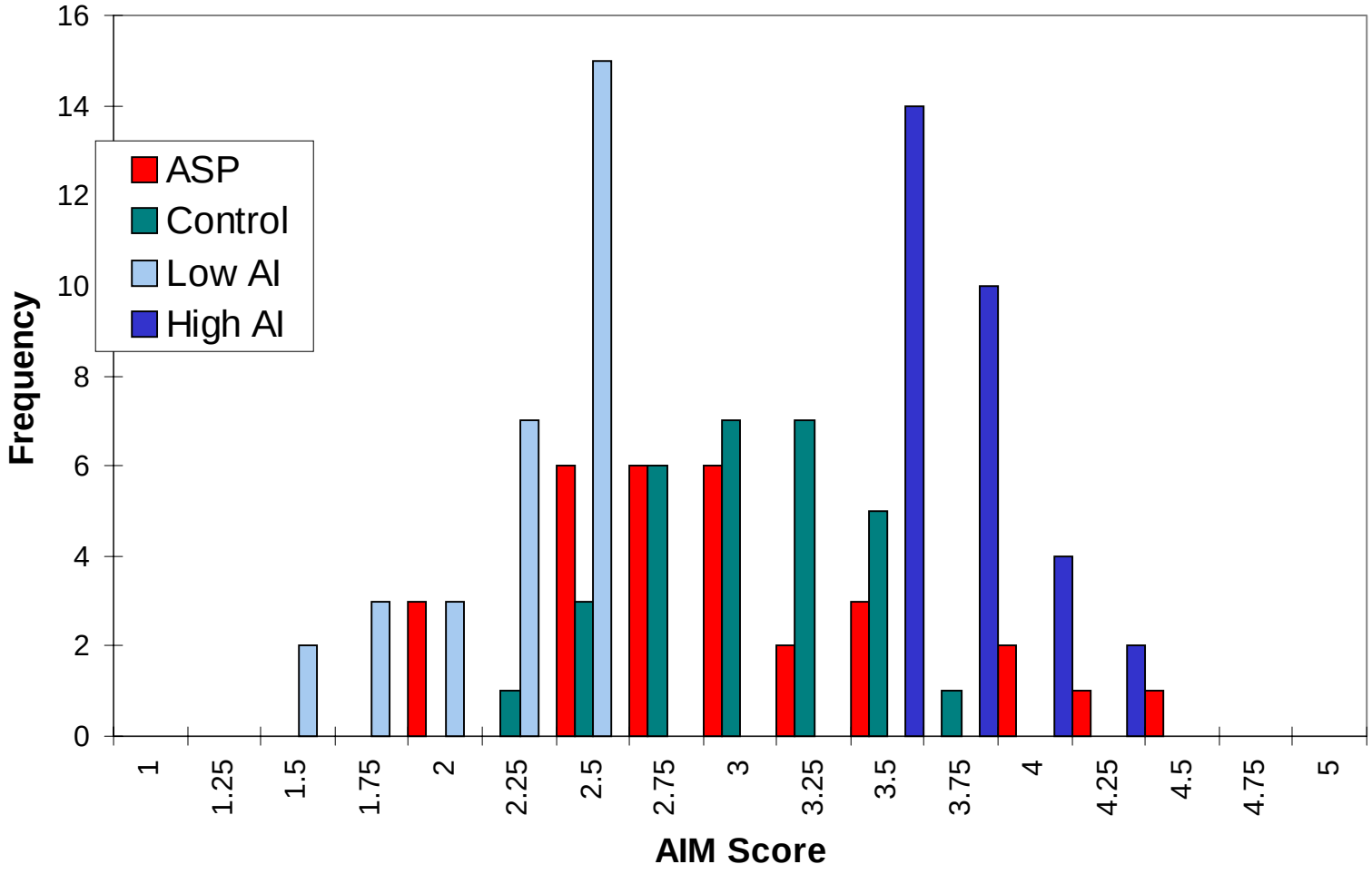

16
14
12
10
8
6
4
2
0
Frequency
ASP
Control
Low AI
High AI
1
1.25
1.5
1.75
2
2.25
2.5
2.75
3
3.25
3.5
3.75
4
4.25
4.5
4.75
5
AIM Score

Figure Caption

Figure 2. Mean reaction times during the computer task containing neutral words and during the computer task containing emotional words for the four experimental groups.

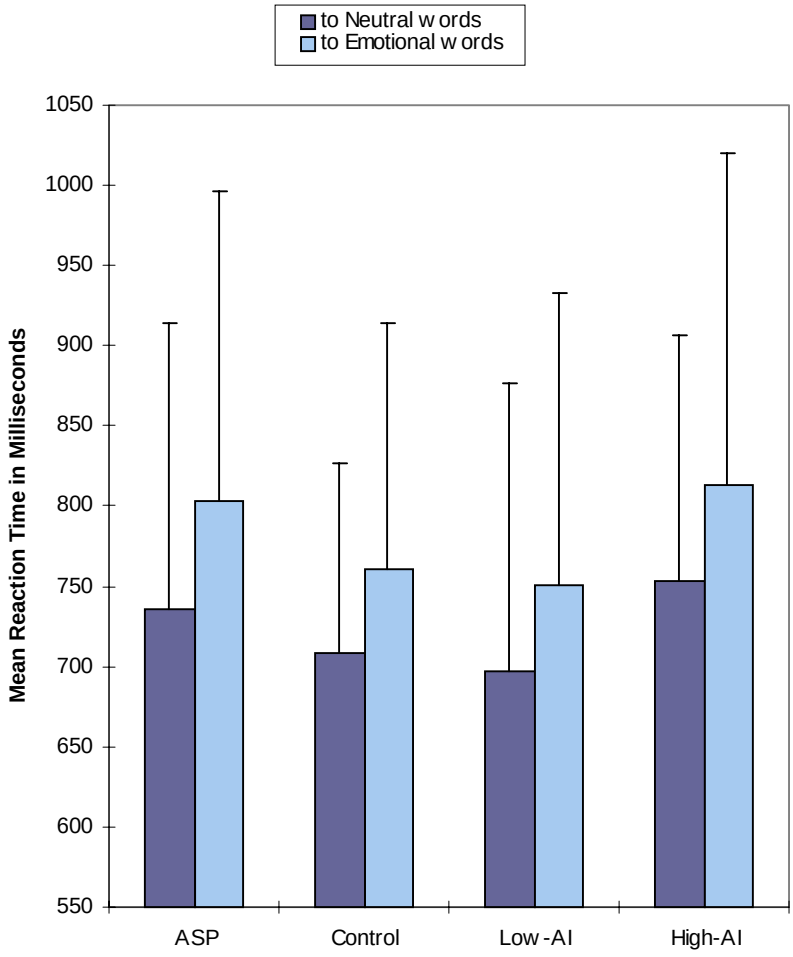

to Neutral words
to Emotional words
Mean Reaction Time in Milliseconds
1050
1000
950
900
850
800
750
700
650
600
550
ASP
Control
Low-AI
High-AI

Figure Caption

Figure 3. Mean reaction times to positive, negative, and neutral words for the four experimental groups.

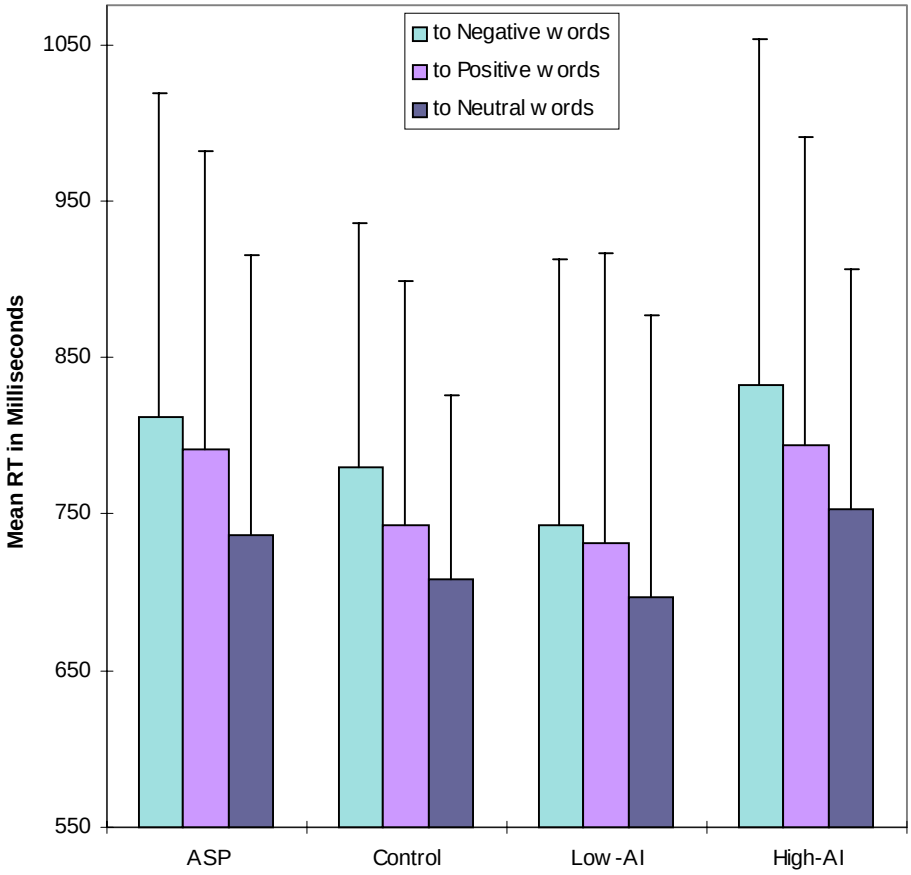

to Negative words
to Positive words
to Neutral words
Mean RT in Milliseconds
1050
950
850
750
650
550
ASP
Control
Low-AI
High-AI

Figure Caption

Figure 4. Scores along the Extroversion dimension of the EPQ for the four experimental groups.

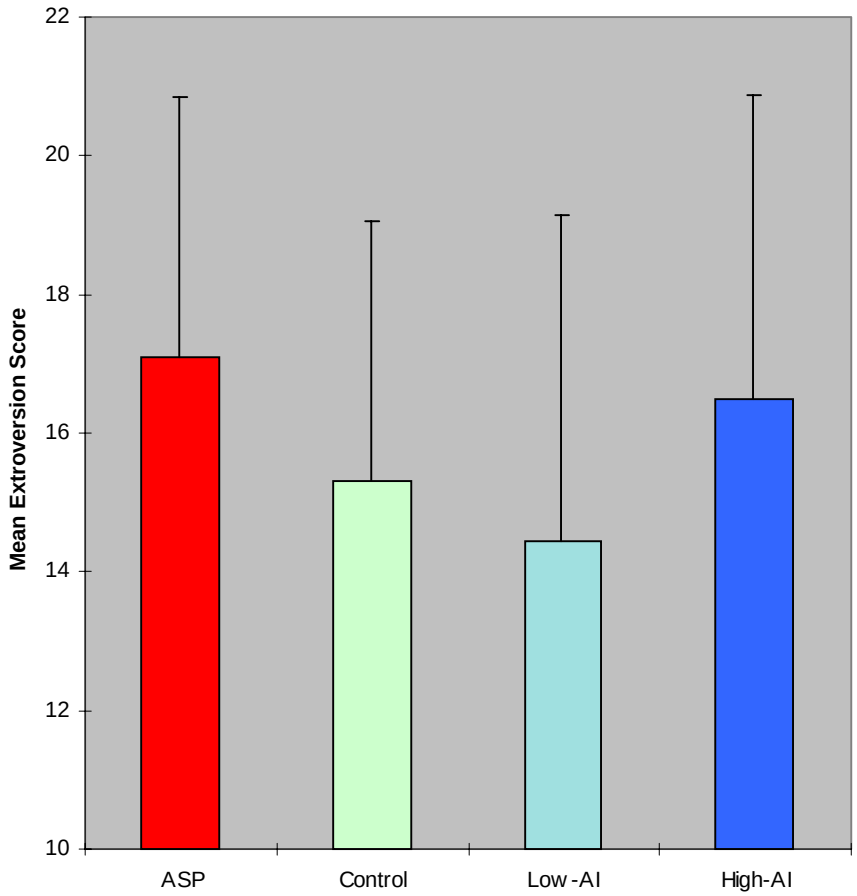

Mean Extroversion Score
22
20
18
16
14
12
10
ASP
Control
Low -AI
High-AI

Figure Caption

Figure 5. Scores along the Neuroticism dimension of the EPQ for the four experimental groups.

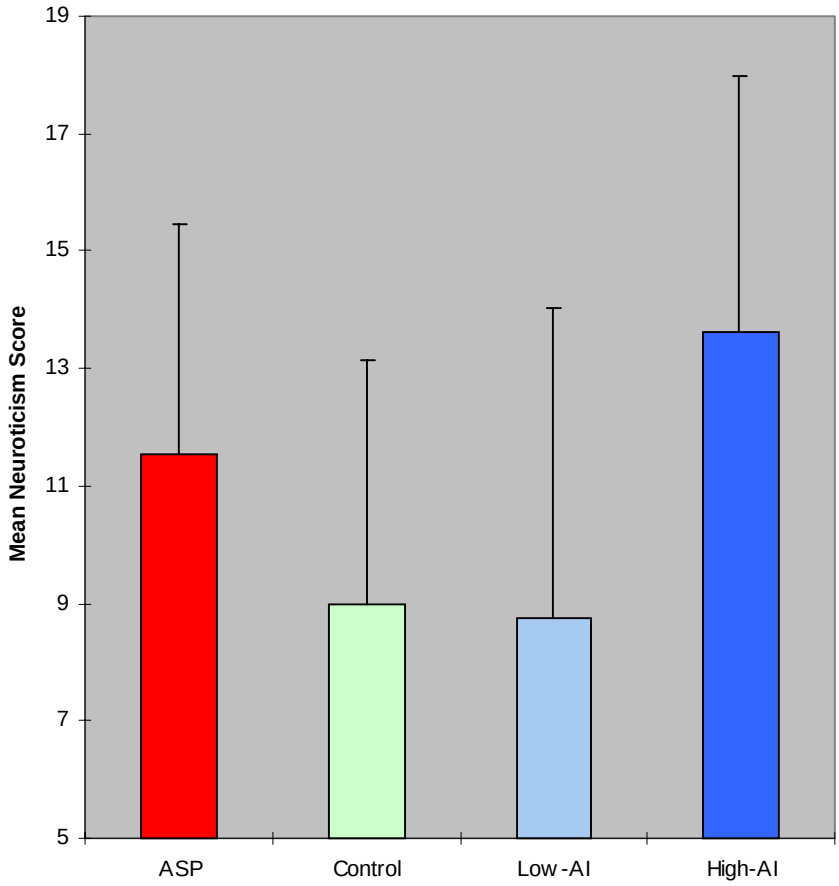

Mean Neuroticism Score
19
17
15
13
11
9
7
5
ASP
Control
Low-AI
High-AI

Figure Caption

Figure 6. Scores along the Psychoticism dimension of the EPQ for the four experimental groups.

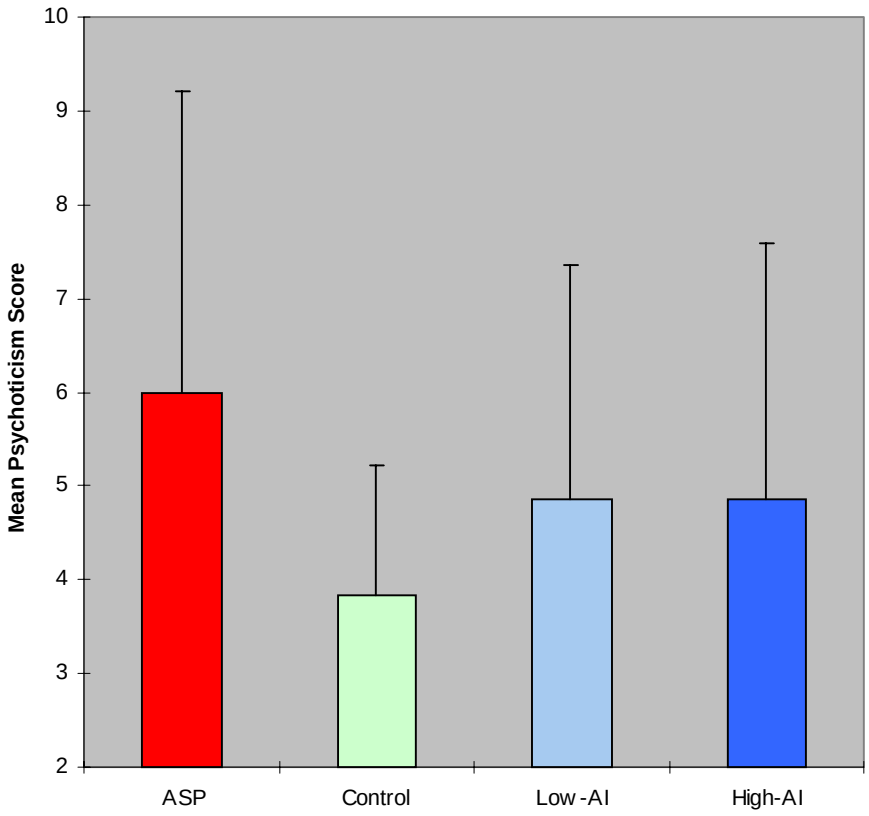

Mean Psychoticism Score
10
9
8
7
6
5
4
3
2
ASP
Control
Low -AI
High-AI

Figure Caption

Figure 7. Scores along the Lie dimension of the EPQ for the four experimental groups.

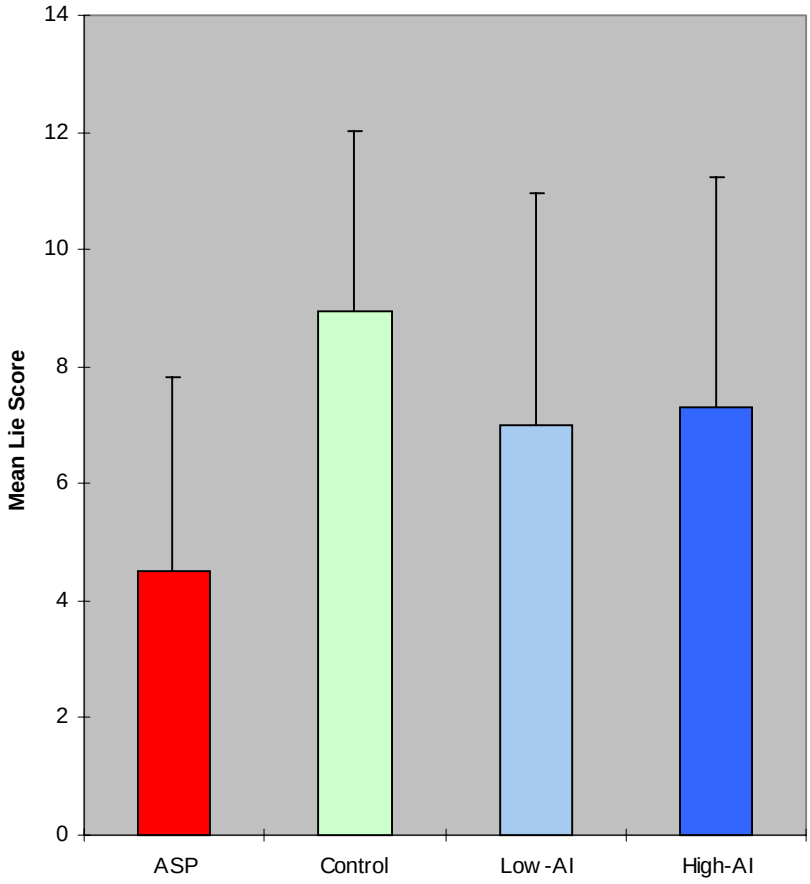

Mean Lie Score
14
12
10
8
6
4
2
0
ASP
Control
Low -AI
High-AI

Figure Caption

Figure 8. Means and standard deviations for Arousal P scores for the five experimental groups.

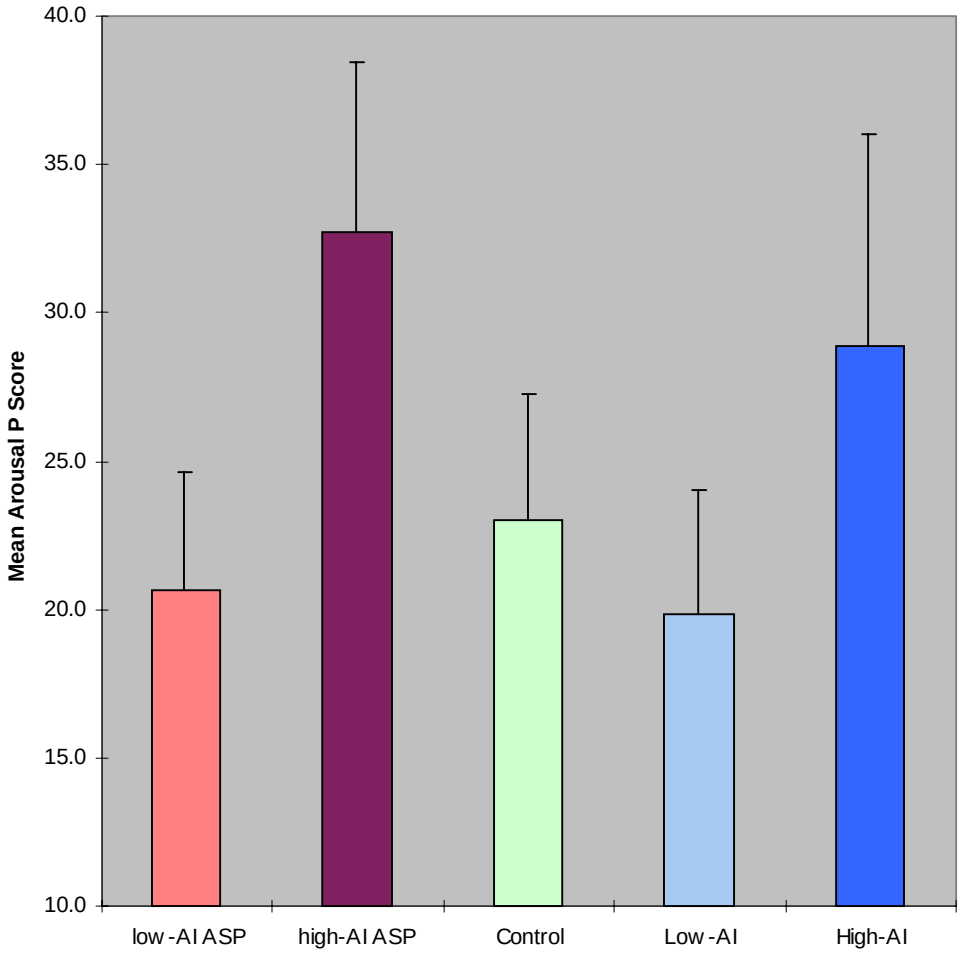

40.0
35.0
30.0
25.0
20.0
15.0
10.0
Mean Arousal P Score
low -AI ASP
high-AI ASP
Control
Low -AI
High-AI

Figure Caption

Figure 9. Means and standard deviations for mean reaction times to neutral and emotional words for the five experimental groups.

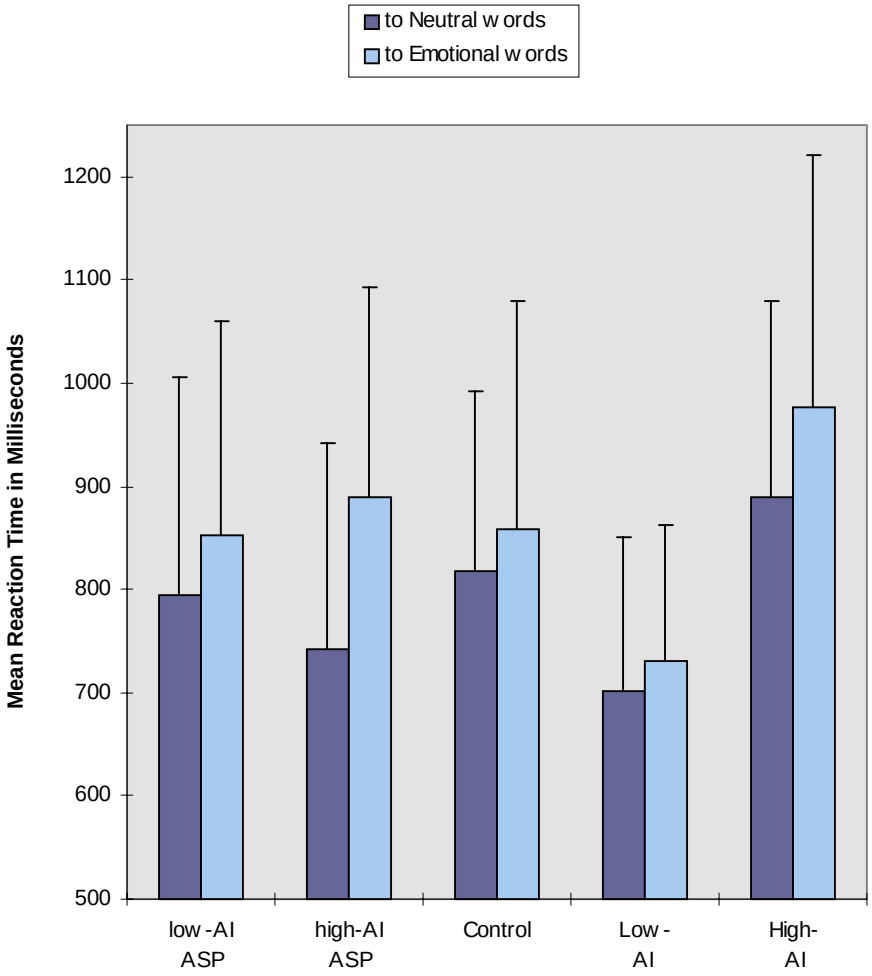

to Neutral words
to Emotional words
Mean Reaction Time in Milliseconds
1200
1100
1000
900
800
700
600
500
low-AI ASP
high-AI ASP
Control
Low-AI
High-AI

Figure Caption

Figure 10. Means and standard deviations for mean reaction time change scores for the five experimental groups.

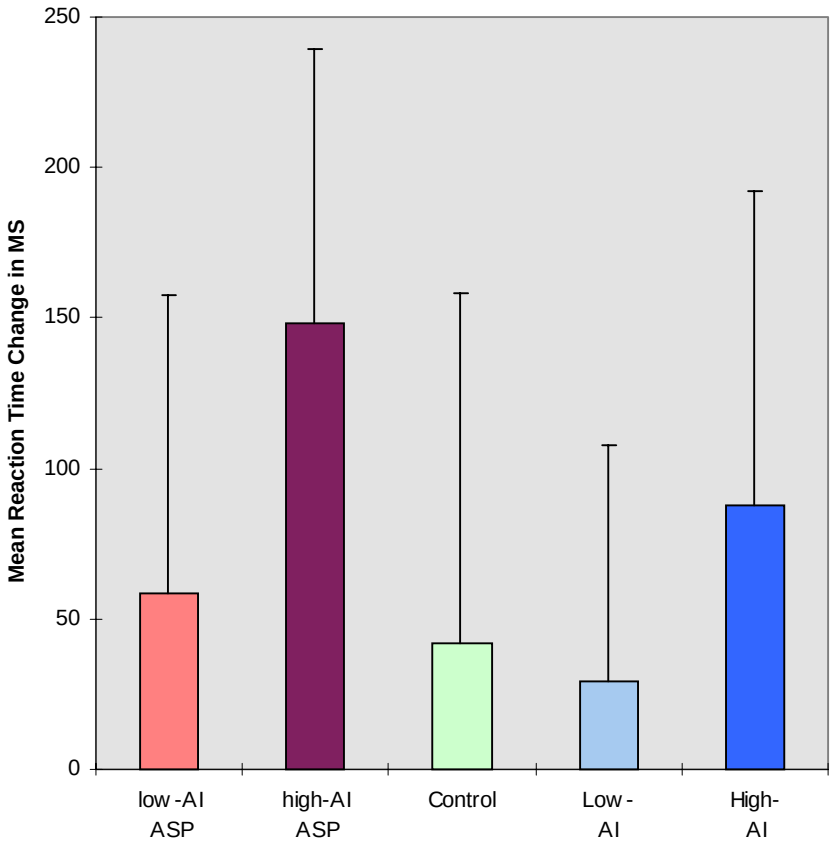

Mean Reaction Time Change in MS
250
200
150
100
50
0
low -AI ASP
high-AI ASP
Control
Low - AI
High- AI

Figure Caption

Figure 11. Means and standard deviations for mean Energy scores for the five experimental groups.

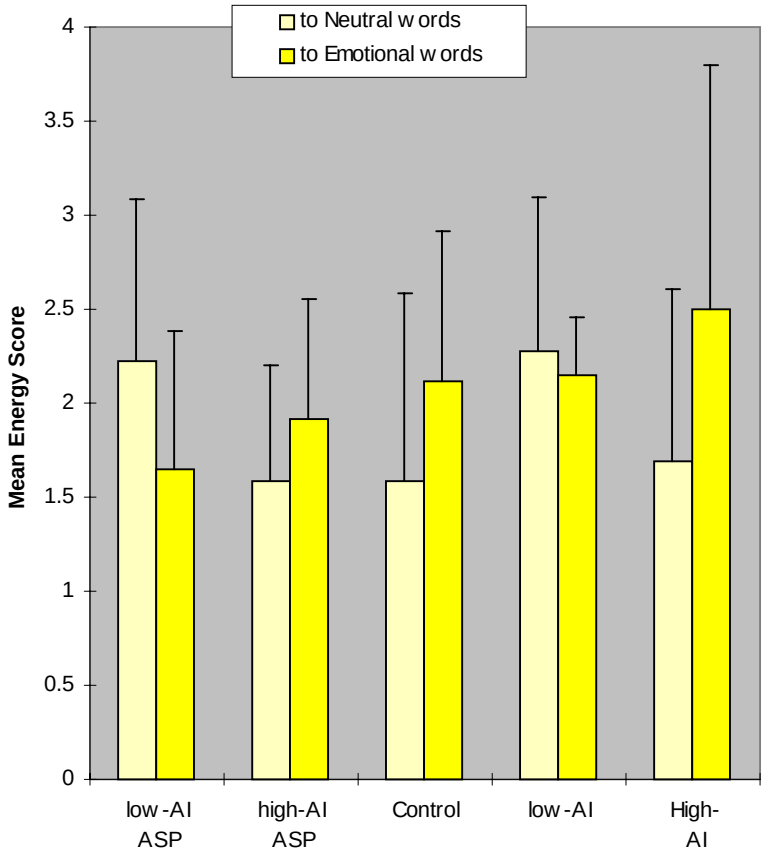
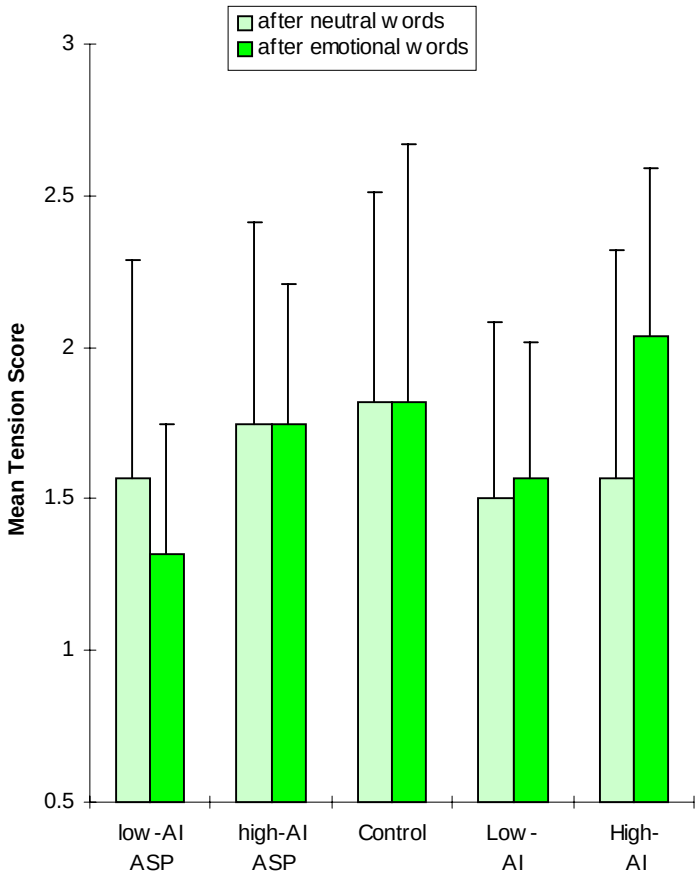

to Neutral words
to Emotional words
Mean Energy Score
4
3.5
3
2.5
2
1.5
1
0.5
0
low-AI ASP
high-AI ASP
Control
low-AI
High-AI

Figure Caption

Figure 12. Means and standard deviations for mean Tension scores for the five experimental groups.


after neutral words
after emotional words
Mean Tension Score
3
2.5
2
1.5
1
0.5
low-AI ASP
high-AI ASP
Control
Low-AI
High-AI

Appendix A

Adjective Check List (Form A)

Each of the words on the back describes feelings or moods. Please use the rating scale next to each word to describe your feelings *at this moment.*

EXAMPLES:

relaxed	vv	v	?	no	If you circle the double check (vv) it means that you definitely feel relaxed *at the moment.*
relaxed	vv	v	?	no	If you circle the single check (v) it means that you feel slightly relaxed *at the moment*.
relaxed	vv	v	?	no	If you circle the question mark (?) it means that the words does not apply or you cannot decide if you feel relaxed *at the moment.*
relaxed	vv	v	?	no	If you circle the no it means that you are *definitely not* relaxed *at the moment*.

Work rapidly, but please mark all the words. Your first reaction is best. This should take only a couple of minutes.

vv v ? no : definitely feel
vv v ? no : feel slightly
vv v ? no : cannot decide
vv v ? no : definitely do not feel

1. carefree	vv	v	?	no
2. serious	vv	v	?	no
3. peppy	vv	v	?	no
4. pleased	vv	v	?	no
5. leisurely	vv	v	?	no
6. sleepy	vv	v	?	no
7. jittery	vv	v	?	no
8. grouchy	vv	v	?	no
9. energetic	vv	v	?	no
10. calm	vv	v	?	no
11. suspicious	vv	v	?	no
12. regretful	vv	v	?	no
13. stirred-up	vv	v	?	no
14. aroused	vv	v	?	no
15. still	vv	v	?	no
16. self-centered	vv	v	?	no
17. wide-awake	vv	v	?	no
18. skeptical	vv	v	?	no
19. activated	vv	v	?	no
20. sad	vv	v	?	no
21. nonchalant	vv	v	?	no
22. quiescent	vv	v	?	no
23. clutched-up	vv	v	?	no
24. active	vv	v	?	no
25. alert	vv	v	?	no

Appendix B

Adjective Check List (Form B)

Each of the words on the back describes feelings or moods. Please use the rating scale next to each word to describe your feelings *at this moment.*

EXAMPLES:

relaxed	vv	v	?	no	If you circle the double check (vv) it means that you definitely feel relaxed *at the moment.*
relaxed	vv	v	?	no	If you circle the single check (v) it means that you feel slightly relaxed *at the moment*.
relaxed	vv	v	?	no	If you circle the question mark (?) it means that the words does not apply or you cannot decide if you feel relaxed *at the moment.*
relaxed	vv	v	?	no	If you circle the no it means that you are *definitely not* relaxed *at the moment*.

Work rapidly, but please mark all the words. Your first reaction is best. This should take only a couple of minutes.

vv v ? no : definitely feel
vv v ? no : feel slightly
vv v ? no : cannot decide
vv v ? no : definitely do not feel

1. placid	vv	v	?	no
2. egoistic	vv	v	?	no
3. intense	vv	v	?	no
4. engaged-in-thought	vv	v	?	no
5. tired	vv	v	?	no
6. vigorous	vv	v	?	no
7. witty	vv	v	?	no
8. at-rest	vv	v	?	no
9. affectionate	vv	v	?	no
10. drowsy	vv	v	?	no
11. anxious	vv	v	?	no
12. blue	vv	v	?	no
13. lively	vv	v	?	no
14. full-of-pep	vv	v	?	no
15. concentrating	vv	v	?	no
16. quiet	vv	v	?	no
17. rebellious	vv	v	?	no
18. quick	vv	v	?	no
19. overjoyed	vv	v	?	no
20. wakeful	vv	v	?	no
21. fearful	vv	v	?	no
22. tense	vv	v	?	no
23. warm-hearted	vv	v	?	no
24. defiant	vv	v	?	no
25. sluggish	vv	v	?	no

Appendix C

Stimuli Used in Computer Tasks

Emotional Stimuli

Positive words	Positive non-words	Negative words	Negative non-words
Kiss	Kest	War	Wot
Glee	Glea	Ghost	Grost
Loyal	Lodal	Mourn	Poard
Bliss	Brids	Loathe	Goetre
Happy	Lapsy	Satan	Jouse
Smile	Spole	Cruel	Snuke
Amuse	Amose	Panic	Sleol
Marry	Monny	Scream	Presem
Praise	Proote	Misery	Masard
Warmth	Wernth	Behead	Somead
Humor	Hotour	Funeral	Fanotal
Caress	Corest	Savage	Setuge
Honor	Hodoar	Terror	Patmar
Delight	Doleght	Malice	Charch
Feeling	Doesint	Slay	Ladi
Passion	Pestion	Pain	Deok
Intense	Ontinze	Hate	Coud
Tranquil	Tridsoal	Jealous	Deokous
Hug	Ric	Disgust	Tistere
Special	Sleciol	Torture	Gondare

Neutral Stimuli

Neutral words	Neutral non-words	Neutral words	Neutral non-words
Money	Siney	Action	Axtios
Dirt	Dirl	Indian	Insief
Town	Toan	Toad	Toas
Sail	Saim	Writer	Wriser
Clue	Clum	Uncle	Oncle
Water	Worte	Soap	Stap
Summer	Sommer	Number	Nambe
Hair	Sair	Leaf	Leof
Pencil	Dencil	Green	Greep
Fan	Fon	Mug	Mig
Pan	Pag	Parcel	Pamcel
Ride	Rime	Navy	Novy
White	Chite	Tent	Tont
Leg	Lig	Bus	Bas
Dog	Rog	Seek	Ceek
Time	Tome	Bird	Berd
Father	Futher	King	Kang
Sleep	Sleop	Blue	Brue
Sweet	Sweel	Sock	Seck
Book	Boak	Star	Ster

Practice Stimuli

Practice words	Practice non-words	Practice words	Practice non-words
Arm	Arom	Camp	Cemp
Cat	Caet	Hide	Hidoe
Hour	Hourom	Lark	Tark
Sky	Sko	Soil	Noil
Sugar	Shugir	City	Biny

Curriculum Vitae

Trina Doran Cyterski

355 New Kent Rd. Blacksburg, VA 24060 (540)951-1880 tdoran@vt.edu

Career Objective: Research and teaching at the university level utilizing my skills and interest in social cognition, emotion, and arousal theories as they apply to psychopathy.

Education:

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
Blacksburg, VA
Ph.D. in Psychological Sciences, May 1999
(Biobehavioral Tract)
GPA: 3.76

HOLLINS COLLEGE, Roanoke, VA
M.A. in General Experimental Psychology, July 1995
GPA: 3.8

COLLEGE OF CHARLESTON, Charleston, SC
B.S., May 1994
Major: Psychology Minor: Sociology
GPA: 3.76

Relevant Research Experience and Training

TEACHING

Introductory Psychology Lab (Fall, 1995; Spring, 1996)
-Evaluated student's writings, lead discussion groups, and encouraged critical thinking skills.

Lecture TA for Introductory Psychology (Fall, 1996)
-Met with students individually for private tutoring
-Wrote test questions to asses knowledge of lecture material

Social Psychology Labs (Spring, 1997)
-Guided students through group projects requiring them to design a study, gather and analyze data, write up the project, and present the results to the class.

Advanced Social Psychology (Fall, 1997)
-Taught a three credit course for Junior and Senior Psychology majors only.

Psychology of Personality (Spring, 1998)
-Taught two sections of the course which covered theories of personality from biological, behaviorist, and social-cognitivists perspectives.

Social Psychology (Fall, 1998; Spring, 1999)
-Taught three sections of the course.

Psychology of Learning (Spring, 1999)
-Taught one section where the primary objective was to familiarize the student with the processes of learning by stressing the applicability of key concepts.

RESEARCH ASSISTANT

VA Criminal Sentencing Commission Richmond, VA (Summer, 1996)

-Traveled to counties in SW VA to gather social history information from the juvenile records of currently convicted adult felons.

-Identified factors correlated with a high probability of recidivism to develop an offender risk assessment instrument that would predict the relative risk that a felon would become a threat to public safety if placed in alternative sanctions.

MASTERS RESEARCH

Worked at the Hollins Communications Research Institute with stutterers enrolled in the Precision Fluency Shaping Program. Roanoke, VA (1994-95)

-Investigated the effects of phase shifting vocal tone feedback on speech fluency.

PREVIOUS RESEARCH

Exploring the relationship between the Machiavellian personality construct and cognitive abilities to inhibit distracting information.

-Russell, D.P., & Doran, T.D. (1997). Thought processes of Machiavellians. Paper presented at the 43rd Annual Meeting of the Southeastern Psychological Association; Atlanta, GA.

-Poster presented at the Virginia Tech Symposium 1997

Investigating the nature of death penalty attitudes in Retentionists, Abolitionists and "Switchers" – people who switch from agreeing with, to opposing capital punishment if an alternative punishment to death existed.

-Doran, T.D., & Axsom, D. (1998). The Nature of Death Penalty Attitudes in Retentionists, Abolitionist, and "Switchers". Poster presented at the American Psychological Association Conference; San Francisco, CA.

-Paper submitted for publication to ERIC Clearinghouse on Social Studies/Social Science.

DISSERTATION RESEARCH

An examination of the affect intensity (AI) in Aberrant Self-Promoters (ASPs) – a subclinical level of psychopathy.

-Reaction times to emotional and neutral stimuli were measured and perceptions of arousal were assessed following the processing of such material.

-Preliminary results indicate that ASPs, like psychopaths, should be divided into primary types who are low in AI and secondary types who are high in AI.

- Controls react significantly slower to emotional compared to neutral stimuli in a lexical decision task, whereas ASPs who are low in AI do not demonstrate reaction time differences.

-ASPs who are low in AI show decreases in energetic and tense arousal after emotional word tasks, whereas high-AI individuals show increases.

TRAINING

Trained to score the Psychopathy Checklist-Revised (Hare, 1980) (summer, 1996).

Assisted in training graduate students to score the PCL-R (summer, 1998)

Conducted interviews to assess aberrant self-promotion using the PCL-R (spring, 1999)

PROFESSIONAL ACTIVITIES

Graduate student representative and secretary of the Commission on Faculty Affairs (CFA) (1997-98)

PROFESSIONAL MEMBERSHIPS

Student affiliate of the American Psychological Association (APA)
Student affiliate of the Southeastern Psychological Association (SEPA)

HONORS

National Dean's List (1990-94)
Psi Chi Honor Society (1992-96)
Who's Who Among American Colleges & Universities (1993)
The Honor Society of Sigma Alpha Phi (1994)
The Honor Society of Phi Kappa Phi (1994)

Additional Experience

RESEARCH ASSISTANT (1993 -94)

Medical University of South Carolina; Charleston, SC

-Interpreted and wrote reviews on literature pertaining to coping skills following a disaster or trauma.

INDEPENDENT RESEARCH STUDY Psychology Department

College of Charleston; Charleston, SC

-Designed and conducted an experiment to investigate memory and learning acquisition for stimuli presented in visual and olfactory modalities.

- Bowers, R.L., Doran, T.D., Edles, P.A., & May, K. (1994). Paired associate learning with visual and olfactory cues: Effects of temporal order. The Psychological Record, 44, 501-507.

- Poster presented at the College of Charleston Scientific Poster Session (1993).

DEPARTMENT HEAD (summer, 1993)

Summer Camp at Jewish Community Center; Charleston, SC

-Responsible for Senior and Junior Counselors, and 35 campers.

-Planned and supervised daily activities, consulted regularly with parents, and maintained organized files.

DAY CARE INSTRUCTOR (Summer 1992)

Wee Care Beaufort, SC

-Planned and implemented activities as the primary caretaker for 11 two year-olds.

Alexandria Community Center Y, VA (8/88 - 12-88)

-Substituted at after-school daycares for all Elementary schools in the area.

WAITRESS

Bocci's Italian Restaurant. Charleston, SC (1991-92)
Banana's Restaurant. Beaufort, SC (summers of 1992, 1994)
Sport's Pub and Grill. Charleston, SC (1993)
PK's. Blacksburg, VA (1996-97)