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Self-Serving Cognitive Distortions and Antisocial Behavior among Adults and Adolescents

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## Abstract

The reliability and validity of the self-report questionnaire How I Think (HIT), designed to assess self-serving cognitive distortions related to antisocial behavior, was tested among Swedish incarcerated and non-incarcerated adults and adolescents (N = 364). The results showed that self-serving distortions were more common among incarcerated individuals and that they predicted self-reported antisocial behavior among adults. Confirmatory factor analysis revealed, in contrast to earlier findings, that the underlying structure of the HIT was best explained by a 3-factor-solution with 1 major cognitive factor, referred to as “criminal mind”. It was concluded that the HIT, after further examination of its structural and divergent validity, could be used as a measure of criminal thinking in adults as well as in adolescents.

Keywords: HIT; self-serving cognitive distortions; antisocial behavior; criminal attitudes; dynamic risk assessment;

## Self-Serving Cognitive Distortions and Antisocial Behavior among Adults and Adolescents

Within the field of forensic practice and research, criminal attitudes have been recognized as possible facilitators of, and potentially important mediators in, the understanding, prediction, and treatment of antisocial behavior (Andrews & Bonta, 2003; Liau, Barriga & Gibbs, 1998; Sykes & Matza, 1957). As stated by Sestir and Bartolow (2007, p. 158), “to fully understand the nature of human aggression and violence, we must understand how it functions at the level of cognition”.

Previous research has provided some evidence for a link between cognition and antisocial behavior (Bandura, 1991; Barriga, Landau, Stinson, Liau & Gibbs, 2000; Palmer, 2007; Walters, 2002), and that offenders displayed distinct criminal thinking patterns was observed in early clinical work by Yochelson and Samenov (1976). Empirical findings have demonstrated that sexual offenders and perpetrators of domestic violence display unique cognitive distortions related to their offending behavior (Gilchrist, 2007; Langton, 2007; Ward, Hudson & Keenan, 2001). In a review of modern aggression theory, Sestir and Bartholow (2007) concluded that there is strong evidence, both from practice and research, for a link between cognition and aggressive behavior. Gendreau, Little, and Goggin (1996) found in a meta-analysis that criminogenic needs (e.g., antisocial cognitions, values, and behaviors) was the best predictor of adult recidivism. In line with this, antisocial attitudes also seem to be associated with misbehavior inside institutions (Gendreau, Goggin & Law, 1997) and with lower levels of treatment engagement, poorer treatment motivation, and lower levels of psychosocial functioning among drug-using offenders (Best, Day, Campbell, Flynn & Simpson, 2009). Thus, there is empirical evidence for a relationship between criminal attitudes and antisocial behavior.

There is, however, no consensus on the terminology pertaining to criminal attitudes (Simourd & Olver, 2002). The terminology used in this area includes labels like “antisocial

attitudes” (Andrews & Bonta, 2003), “criminal thinking style” (Walters, 1995), “social cognition” (Blackburn, 1993), and “self-serving cognitive distortions” (Barriga et al., 2000), to mention just a few examples. In this study, we use the term self-serving cognitive distortions to describe the thinking patterns of offenders.

Cognitive distortions are defined as “inaccurate or biased ways of attending to or conferring meaning upon experiences” (Barriga, Gibbs, Potter & Liao, 2001, p. 1), and the term self-serving cognitive distortions was introduced in order to define cognitive distortions that are specifically associated with externalizing behaviors such as aggression and delinquency (Barriga et al., 2000). The theoretical background to cognitive distortions associated with antisocial behavior stems from social information processing theory (Crick & Dodge, 1994; Dodge, 1980, 1993), where cognitive distortions are characterized as biases in the processing that mediates between incoming stimuli and behavioral responses. Gibbs and Potter (Gibbs, 1991; Gibbs, Potter & Goldstein, 1995) introduced a four-category typological model of self-serving cognitive distortions: *Self-Centered*, *Blaming Others*, *Minimizing/Mislabeling*, and *Assuming the Worst*. *Self-Centered* cognitive distortions are defined as attitudes where the individual focuses on his/her own opinions, expectations, needs, and rights to such an extent that the opinions or needs of others hardly ever or never are considered or respected. *Blaming Others* involves cognitive schemas of misattributing the blame for one's own behavior to sources outside the individual (i.e. external locus of control). *Minimizing* is defined as distortions where the antisocial behavior is seen as an acceptable, perhaps necessary, way to achieve certain goals. *Mislabeling* is defined as a belittling and dehumanizing way of referring to others. Finally, *Assuming the Worst* represents cognitive distortions where the individual attributes hostile intentions to others, considers the worst-case scenario as inevitable or sees his/her own behavior as beyond improvement.

Barriga and Gibbs (1996) divided self-serving cognitive distortions into two types: primary cognitive distortions that are represented by self-centered attitudes (the category *Self-Centered*) and secondary cognitive distortions (the categories *Blaming Others*, *Minimizing/Mislabeled*, and *Assuming the Worst*). According to Barriga et al. (2001), the primary cognitive distortions stem from the egocentric bias most prominently found among young children and reflecting less mature moral judgment stages as defined by Kohlberg (1984). An example of a primary cognitive distortion could be the following quote from a male burglar: “... *My idea in life is to satisfy myself to the extreme. I don't need to defend my behavior. My thing is my thing. I don't feel I am obligated to the world or to nobody*” (Samenov, 2004, p. 86). Such cognitive distortions and the associated behaviors are related to a belief that the individual can do whatever he/she wants – a sense of being above the law. Chambers, Eccleston, Day, Ward, and Howells (2008) described how strong primary cognitive distortions can seriously obstruct rehabilitation readiness since the offender believes that he/she already knows it all and therefore sees no need for personal change. Gibbs (1991) suggested that the role of the secondary cognitive distortions is to reduce the emotional stress that the primary cognitive distortions cause, i.e. to protect the individual's self-image by neutralizing feelings of guilt and self-blame, described as techniques of neutralization by Sykes and Matza (1957). Secondary cognitive distortions can be illustrated by the words of another individual described by Samenov (2004, p. 172): “*Just because I shot a couple of state troopers doesn't mean I'm a bad guy*”.

Several measures of criminal attitudes, thinking styles, and self-serving cognitive distortions have been developed within the forensic field. Some researchers have focused on the cognitive content (what the offender actually thinks or imagines prior to, during, and following an antisocial act) and some on the cognitive processing (the processes that produce criminal thoughts and may result in criminal actions) (Collie, Vess & Murdoch, 2007).

Among the instruments designed to measure cognitive content are the Criminal Attitudes to Violence Scale (CAVS; Polaschek, Collie & Walkey, 2004), the Criminal Sentiments Scale-Modified (CSS-M; Simourd, 1997), and the Measure of Criminal Attitudes and Associates (MCAA; Mills, Kroner & Forth, 2002; Mills, Kroner, & Hemmati, 2004). As for the cognitive processing, a commonly used measure is the Psychological Inventory of Criminal Thinking Styles (PICTS; Walters, 1995) that is designed to measure the process and content of thinking assumed to promote and maintain a criminal lifestyle. Few of the existing instruments have an appropriate theoretical underpinning according to Simourd and Olver (2002). The “How I Think” questionnaire (HIT; Barriga et al., 2001) is, however, one instrument with a theoretical basis that has been empirically tested with promising results and used in a treatment program for adolescents (the EQUIP program; Gibbs et al., 1995). The HIT is based on Gibbs and Potter’s four-category typology of self-serving cognitive distortions.

#### *Aims of the Study*

The present study was designed to test the reliability and validity, including the dimensionality, of the HIT questionnaire among Swedish incarcerated and non-incarcerated adults and adolescents. The following specific hypotheses were addressed:

- I. The HIT questionnaire can successfully discriminate between incarcerated and non-incarcerated adults and adolescents as the incarcerated groups exhibit higher levels of self-serving cognitive distortions than the non-incarcerated groups.
- II. Higher rates of self-serving cognitive distortions as measured by the HIT are positively associated with self-reported antisocial behavior among adults.
- III. The latent structure of the HIT questionnaire presents four distinct clusters of self-serving cognitive distortions according to the typological model of Gibbs and Potter (Gibbs, 1991).

#### Method

### *Participants*

The adult sample ( $n = 116$ ) consisted of two subgroups, one of male prison inmates ( $n = 56$ ) and one of male university students ( $n = 60$ ). The prison sample was taken from two low to medium security prisons in Sweden, and the participants had a mean age of 36.8 years (range 20-58), while the university students had a mean age of 20.4 years (range 19-24) and came from an engineering education program at a university in Sweden. The age difference between the groups was significant,  $t(1,56) = -12.7, p < .001$ . The most common self-reported crimes among the incarcerated adults were drug offences (83.9 %), theft (60.7 %), and major driving violations (60.7 %).

The adolescent sample ( $n = 248$ ) included two subgroups, one of adolescents incarcerated under the Care of Young Persons Act in Sweden ( $n = 58$ ) and one of non-incarcerated adolescents from primary and secondary education facilities in Sweden ( $n = 190$ ). All the incarcerated adolescents had problems with antisocial behavior, such as criminality and substance abuse. The mean age of the incarcerated adolescents was 15.8 years (range 14-18) and that of the non-incarcerated adolescents 15.2 years (range 13-18). Data from the adolescent groups has previously been reported by Lardén, Melin, Holst, and Långström (2006). The demographic characteristics of the adult and adolescent groups are shown in Table 1.

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 Insert Table 1 about here  
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### *Measures*

*HIT*. The How I Think questionnaire (Barriga, Gibbs, Potter & Liao, 2001) is a 54-item self-report questionnaire designed to measure self-serving cognitive distortions. Participants respond on a six-point Likert scale (from “agree strongly” to “disagree strongly”), with



higher scores reflecting higher levels of cognitive distortions. The questionnaire contains 39 items stating attitudes or beliefs, eight items controlling for anomalous responses, and seven items acting as positive fillers. The 39 items stating attitudes or beliefs are divided into two dimensions with four subscales each: one measuring self-serving cognitive distortions (the subscales Self-Centered, Blaming Others, Minimizing/Mislabeling, and Assuming the Worst) and one measuring antisocial behavior (the subscales Opposition-Defiance, Physical Aggression, Lying, and Stealing). For example, the item “If you don’t push people around, you will always get picked on” represents the cognitive distortion Assuming the Worst and the antisocial dimension Physical Aggression. The scales measuring antisocial behavior refer to the four categories of antisocial behavior in the conduct disorder and oppositional-defiant disorder syndromes in the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV; American Psychiatric Association, 1994). The antisocial behavior scales are categorized into overt versus covert antisocial behavior, where overt antisocial behavior implies a direct confrontation with the victim. The theoretical structure of the instrument is shown in Figure 1. The Swedish version used in the study was translated by Lardén et al. (2006). The HIT has previously showed promising psychometric characteristics (e.g. Barriga et al 2001; Barriga & Gibbs, 1996; Barriga, Hawkins & Camelia, 2008; Nas, Brugman & Koops, 2008) for adolescent samples within various contexts. The research on the HIT for adult groups is, to our knowledge, so far limited to a few studies within correctional facilities (Hubbard & Pealer, 2009; Liau et al., 2004) and none has examined the reliability and validity of the HIT for adult groups.

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Insert Figure 1 about here

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*The SCID-II Screen.* The Structured Clinical Interview for DSM-III-R-Axis II Disorders, screening version (SCID-II Screen; Spitzer, Williams, Gibbon and First, 1991) is a self-report questionnaire designed to cover the underlying criteria for the DSM-III-R personality disorders and to provide screening of individuals who require particularly detailed diagnostic assessments (Spitzer, Williams, Gibbon & First, 1989). The original questionnaire consists of 123 questions with a dichotomous answering format (yes/no). It is constructed to be deliberately over inclusive in order to avoid false negative answers. Used in this study were only the questions for antisocial personality disorder (SCID ASPD) and conduct disorder during childhood (SCID CD). The SCID-II Screen was administered to the adult groups alone, as it is not appropriate for adolescents. The internal consistency of the SCID-II Screen was good, with Cronbachs alpha of .90 for the total measure of antisocial traits, and .83 for both SCID CD and SCID ASPD.

*Demographic data.* Demographic data was collected with a questionnaire in two versions – one for the incarcerated adult group and one for the adult university students – covering age, previous criminality, and level of education.

#### *Procedure*

The non-incarcerated adult subjects were contacted and informed of the study by e-mail. Those who agreed to participate gave written informed consent in conjunction with a lecture, after which the questionnaires were administered to be filled out individually. For access to the incarcerated sample, the managements of two low to medium security prisons in middle Sweden were contacted for permission to conduct the study. The inmates were then informed about the study, in writing and orally, by ward staff who in turn had been informed by one of the authors. After written consent was obtained, the inmates were given the opportunity to fill out the questionnaires individually. In one of the prisons, 92.5 % of the inmates chose to participate, while the desire to participate at the other prison was higher than needed for the

study. All adult participants were given a national lottery ticket as compensation for their participation.

For a detailed description of the procedure in the adolescent groups, see Lardén et al. (2006). Nine institutions for juvenile delinquents run by the Swedish National Board of Institutional Care were approached, all of which agreed to participate. The manager at each institution asked the residents to participate; individuals who were not able to speak or read Swedish reasonably well were excluded. The HIT questionnaire was administered during or after school hours to groups of two to five youths or individually, depending on the routines of each particular institution. For the non-incarcerated adolescents, eight public schools were initially contacted, five of which agreed to participate in the study. Pupils were informed about the study by their teachers, after which the parents received written information about the project and gave or declined written consent for their child's participation in the study. Upon parental informed consent, the questionnaire was administered to a full class during school hours.

#### *Statistical analyses*

The data was analyzed with PASW 18.0 software, using two-tailed p-values. The internal consistency of the HIT questionnaire was examined with Cronbach's alpha, while group differences were analyzed using Student's t-test. In order to examine the predictive ability of self-serving cognitive distortions for antisocial behavior, a Receiver Operating Characteristics analysis (ROC-analysis) was performed with a dichotomized measure of a high level of criteria fulfilled for antisocial personality disorder according to the SCID-II Screen as dependent variable. Non-parametric (Spearman's coefficients,  $r_s$ ) and parametric correlations (Pearson's coefficients,  $r$ ) were used in order to investigate the convergent and discriminant validity of the HIT questionnaire, the choice of method depending on the distribution of the data. A three-way analysis of variance (ANOVA) with Tukey-Kramer's

post hoc test was performed to test the influence of possible confounding factors on the relationship between self-serving cognitive distortions and antisocial behavior. In order to test the theoretical structure of the HIT questionnaire, confirmatory factor analyses using AMOS (Arbuckle & Wothke, 1999) were performed comparing a six-factor model (four cognitive distortion or four behavioral referent factors, one anomalous responding factor and one positive fillers factor) to a three-factor model (one comprehensive cognitive distortion or behavioral referent factor, one anomalous responding factor and one positive fillers factor) in accordance with the procedure of Barriga et al. (2001).

### *Ethics*

The study was carried out according to the ethical principles of the Swedish Council for Research in Humanities and the Social Sciences (1996) and was approved by the Research Ethics Committee at the University of Linköping. All subjects gave informed consent to participate in the study, and for the youth samples parental informed consent was required.

## Results

### *Reliability*

Internal consistency was overall acceptable to high for the total HIT scale as well as for the cognitive distortion and behavioral referent subscales in all subgroups (Table 2). The Blaming Others, Lying, and Anomalous Responding scales, however, showed low internal consistency in one of the adult groups. The camouflage scale Positive Fillers showed overall low internal consistency. Item exclusion did not affect the results in a significant way.

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Insert Table 2 about here

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### *Group Differences in Self-Serving Cognitive Distortions*

When the total HIT scores were compared between the incarcerated and the non-incarcerated subgroups, both the incarcerated adults,  $t(1,81) = -6.27, p < .001$ , and adolescents,  $t(1,73) = -9.97, p < .001$ , showed more self-serving cognitive distortions than the non-incarcerated groups (Table 3). This was true also for all the subscales of the HIT, with the exception of the Anomalous Responding and Positive Fillers scales, where the non-incarcerated adolescents scored higher than the incarcerated adolescents;  $t(1, 246) = 8.40, p < .001$  and  $t(1, 246) = 35.16, p < .001$ , respectively. When the adult and adolescent groups were compared, the adolescent groups showed more self-serving cognitive distortions as measured by the total HIT-score than did the adult groups;  $t(1,175) = -4.25, p < .001$  for the non-incarcerated groups and  $t(1,105) = -5.98, p < .001$  for the incarcerated groups.

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Insert Table 3 about here

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*Self-Serving Cognitive Distortions and Antisocial Behavior.*

Incarcerated adults scored higher than non-incarcerated adults on the total SCID-II measures of antisocial behavior,  $t(1,89) = -14.06, p < .001$ , conduct disorder,  $t(1,79) = -9.94, p < .001$ , and antisocial personality disorder,  $t(1,114) = -16.20, p < .001$ . Strong correlations between antisocial behavior as measured by the SCID-II screen and the HIT scales were found in the collapsed adult group (Table 4).

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Insert Table 4 about here

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The HIT total score predicted self-reported antisocial behavior with a moderate to large effect,  $AUC = .82$  (95 % CI: .74 - .90,  $p < .001$ ). When the adult groups were analyzed separately, the HIT displayed a marginal predictive ability for the non-incarcerated group

AUC = .68 (95 % CI: .55 - .82,  $p < 0.05$ ) as well as for the incarcerated group AUC = .66 (95 % CI: .52 - .80,  $p < 0.05$ ).

#### *Self-Serving Cognitive Distortions and Demographic Characteristics*

Age was negatively correlated with the HIT among the incarcerated adults ( $r = -.40$ ,  $p < .01$ ) and the non-incarcerated adolescents ( $r = -.19$ ,  $p < .05$ ). Furthermore, educational level and previous criminal behavior, as measured by number of previous verdicts and criminal diversity, showed no correlation with self-serving cognitive distortions among the incarcerated adults (data provided by author upon request). A three-way ANOVA was conducted on the total adult group in order to investigate the effect of educational level, age group, and possible occurrence of antisocial personality disorder on self-serving cognitive distortions. Significant main effects were found for possible occurrence of antisocial personality disorder ( $F(1) = 6.78$ ,  $p < .05$ ) and educational level ( $F(2) = 3.16$ ,  $p < .05$ ), while no interaction effects were found. Tukey-Kramer's post hoc test revealed that the effect of educational level was due to a considerable higher educational level in the non-incarcerated adults.

#### *Latent Structure of the How I Think Questionnaire*

A confirmatory factor analysis was applied to assess the structure of the HIT questionnaire with AMOS (Arbuckle & Wothke, 1999). Since large samples are preferred for these analyses, the data files of all groups were collapsed ( $N = 364$ ). A six-factor solution (four cognitive distortion factors plus one anomalous responding factor and one positive fillers factor) was tested against a three-factor solution (one comprehensive cognitive distortion or behavioral referent factor, one anomalous responding factor and one positive fillers factor). The analyses showed that the three-factor model had the best fit for the data, ( $N = 364$ ,  $\chi^2 = 2115,981$   $df = 1374$ ,  $p < .0001$ ,  $(2115, 981 / 1374 = 1.5)$ ; RMSEA=.04. Thus, the RMSEA was lower than .05; the ratio between the  $\chi^2$  statistic and the degrees of freedom was

1.5, indicating that the model has a good fit to the data. The six-factor solution was regarded as not admissible because negative variance estimates for the Blaming Others scale indicated that the model is wrong. Thus, these results of the confirmatory factor analyses show that the structure of the HIT questionnaire is best described as a three-factor model with one comprehensive cognitive distortion factor.

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Insert figure 2 about here

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### Discussion

The purpose of the present study was to further examine the psychometric characteristics of the HIT questionnaire and determine if the instrument could be used as a valid and reliable measure of self-serving cognitive distortions among adults as well as among adolescents in Sweden. This study seems to be the first to report data on validity and reliability of the HIT questionnaire among adults. The findings are, with some exceptions, consistent with previous research on adolescents (e.g. Barriga et al., 2001; Barriga & Gibbs, 1996) and provide support for the utility of the HIT questionnaire among adults and adolescents in Sweden. The results also indicate that further investigation on the divergent and structural validity of the HIT is warranted.

As the HIT questionnaire successfully discriminated between incarcerated and non-incarcerated groups, with the incarcerated participants displaying higher levels of self-serving cognitive distortions, the first hypothesis of the study was supported. This was true for both the adults and the adolescents and in line with previous research on adolescents (e.g. Barriga et al., 2001; Lardén et al., 2006). Consequently, the discriminant validity of the HIT was supported for the studied groups. This finding adds to the growing research on cognitive distortions related to antisocial behavior that, along with the theories of Sykes and Matza

(1957) and the clinical investigations by Yochelson and Samenov (1976), reveals a distinct pattern of criminal thinking that separates offenders from non-offenders. Interestingly, the adolescent groups showed more self-serving cognitive distortions than the adult groups. One possible explanation to this phenomenon could be that the adults had developed more mature moral judgments, as Lardén et al. (2006) have previously shown a moderate relationship between socio-moral reasoning and self-serving cognitive distortions. Johnstone and Cooke (2004) suggest that antisocial behavior and egocentricism are more characteristic in youth than in adults due to transient developmental states, which would be in line with adolescents exhibiting more self-serving cognitive distortions than adults. This adds to the significance of finding these kinds of thinking patterns in adult groups.

Self-serving cognitive distortions as measured by the HIT were moderately to highly correlated with self-reported antisocial behavior both during childhood and adulthood among the adults, thus supporting our second hypothesis. Furthermore, the HIT proved to have a strong predictive ability ( $AUC = .82$ ) of self-reported antisocial behavior among the adults. These results strengthen the convergent validity of the HIT questionnaire among adults and are consistent with previous research on similar self-report measures of criminal thinking (Mills et al., 2004; Walters, 1996). Self-serving cognitive distortions seemed somewhat more closely related to antisocial behavior during childhood. This is probably a circular effect, as the behavioral dimension of the HIT is based on the criteria for conduct disorder and opposition-defiance disorder in the DSM-IV. Although self-serving cognitive distortions were related to antisocial behavior, they were not correlated to previous convictions or criminal diversity among the incarcerated adults, i.e. variables commonly connected with persistent antisocial behavior (Hare, 2003). One explanation might be that the results were affected by lack of power ( $n = 56$ ).



The theoretical structure of the HIT questionnaire with four different categories of self-serving cognitive distortions/behavioral referent categories (hypothesis III) was not supported in the present study. On the contrary, the analyses showed that a unidimensional cognitive structure was preferable, which is consistent with Samenov's statement that criminal cognitions over time become consolidated into a holistic "criminal mind". This might be why these results occurred when the structure of the HIT was tested in an adult population and not only in adolescent groups (e.g. Barriga et al., 2001; Nas et al., 2008). Previous studies (Palmer & Hollin, 2003; 2004) have shown different results for the analyses of latent structure of the PICTS (Walters et al., 1995) in adolescent and adult groups. This indicates that there could indeed be a difference in the composition of self-serving cognitive distortions between adults and adolescents. The underlying structure of the "criminal mind" is yet to be firmly established.

When the divergent validity of the HIT questionnaire was examined for the adults in terms of its relationship with demographic characteristics, self-serving cognitive distortions was moderately, negatively correlated with age among the incarcerated adults but not among the non-incarcerated adults, whereas age group in the total adult group had no significant effect. These inconsistent findings do not allow us to confirm that there in fact could be a relationship between age and self-serving cognitive distortions as shown in previous research among adolescents (Nas et al., 2008). Nevertheless, the tendency of self-serving cognitive distortions to decrease with increasing age that was most distinctly seen among the incarcerated adults could possibly be explained by the decline in antisocial behavior among offenders with persistent antisocial behavior after the age of 35 demonstrated by previous research (Hare, Forth & Strachan, 1992). This is made even more likely by the fact that the mean age in the incarcerated adult group was 36.8 years and that in the non-incarcerated adult group only 20.4 years. The interpretation of the possible effect of age on self-serving

cognitive distortions is also complicated by the fact that the non-incarcerated adults showed much less variance in age compared to the incarcerated adults, thereby making it harder to find statistically significant relationships. That self-serving cognitive distortions were negatively related to age only among the incarcerated adults could also be explained by a socio-moral developmental delay among antisocial groups as described by Gibbs et al. (1991).

Educational level showed a significant effect on self-serving cognitive distortions in the analyses. This could probably be ascribed to the marked difference between the adult groups, where the non-incarcerated group was homogenous with respect taken to educational level. As there was no correlation between educational level and self-serving cognitive distortions among the incarcerated adults, the findings are once again inconsistent and, which stresses the need for further examination of the divergent validity of the HIT questionnaire.

The reliability of the HIT scales was in line with previous studies on adolescents (e.g. Barriga et al., 2001; Nas et al., 2008) with very high internal consistency for the total HIT scale. However, two of the cognitive distortion/behavioral referent scales, Blaming Others and Lying, had a lower internal consistency for the non-incarcerated adults than what is generally acceptable (Clark-Carter, 2004). This might be due to the scales containing formulations that might be hard to relate to for a non-institutionalized, adult person, but could also reflect lack of power in the analyses. That the internal consistency was better for the non-incarcerated adolescents might on the other hand reflect that it may be easier to understand and relate to the items during developmental phase of the adolescents, especially as the instrument was originally designed for adolescents. An alarming result was that the validity scale Anomalous Responding did not show satisfactory internal consistency for the incarcerated adults. There are several possible explanations to this, one being that the nature of the items aroused suspicion among the participants, affecting their answers. No matter what, this should be further explored in other groups of adult offenders in order to see whether

it was a temporary trend or not. The fact that the camouflage scale Positive Fillers consistently had a low internal consistency is not, however, problematic as it is not designed to be a reliable scale for clinical use. The total HIT scale had very high internal consistency, indicating that the instrument could be shortened as some of the subscales included measure basically the same construct.

It can thus be concluded that the convergent, discriminant, and predictive validity of the HIT questionnaire was supported in the present study, but that the structural and divergent validity needs further examination before the HIT can be used as a viable instrument within adult forensic practice.

### *Limitations*

One important limitation of the study was that it relied solely on self-report measures. The use of self-report measures within correctional facilities has been questioned due to response distortion, poor content-related validity and reading ability (Edens, Hart, Johnson, Johnson & Olver (2000). Even considering its limitations, self-report is a common procedure when investigating violent cognitions (Collie et al., 2007). Some of the limitations ascribed to self-report might be compensated by the fact that the HIT questionnaire has the Anomalous Responding scale that is designed to screen for “disingenuous, incompetent, or other suspect responding” (Barriga et al., 2001, p. 7). Nevertheless, another methodological approach, based on a structured clinical judgment and/or observations of the participant’s behavior, such as the Psychopathy Checklist-Revised (PCL-R; Hare, 2003), may have been preferable. Another limitation was a small variance in demographic variables due to the composition of the adult non-incarcerated group, which may have obscured meaningful relationships between variables, thereby limiting the possible results of the analyses. Obviously, more reliable and generalizable results could have been obtained if the subjects in all the groups had been matched for demographic data such as age and educational level. The fact that the adult

groups consisted of male participants only is another limitation since it would have been highly interesting to investigate whether gender could produce a significant effect on the self-serving cognitive distortions, as reported in Lardén et al. (2006).

#### *Clinical implications*

The current results provide further support for the notion that self-serving cognitive distortions can improve our understanding, assessment and, possibly, treatment of antisocial behavior. In line with this, further research should be made on criminal attitudes as possible dynamic risk variables for criminal recidivism. According to Douglas and Skeem (2005), one of the greatest challenges within the forensic field is to develop sound methods for assessing changeable aspects of violence risk. There is already empirical evidence that criminal attitudes are changeable and related to risk for criminality and/or violence (Gendreau et al., 1996; Liao et al., 2004; Palmer, 2007). Instruments such as the HIT could possibly be used as a complementary aid in the dynamic risk assessment and management within the forensic field.

#### *Considerations for Future Research*

As the results from the analyses of the latent structure of the HIT questionnaire were not in concordance with previous research, the results of the present study need to be replicated in other studies of adults and adolescents. Furthermore, an overview of the composition of the subscales, especially the Blaming Others scale, should be made in view of their low internal consistency and negative variance estimates. Further tests of the psychometric properties of the HIT with another methodological approach, such as participants matched on demographic characteristics and with a longitudinal design, are warranted. Investigating possible gender differences in self-serving cognitive distortions may also yield interesting findings. As the hypothesis that self-serving cognitive distortions are related to antisocial behavior was confirmed in this study, it seems relevant to test if the HIT questionnaire may be useful as a

tool in the assessment and evaluation of cognitive-behavioral treatment programs directed at antisocial behavior and/or criminal attitudes among adults. Furthermore, it would be interesting to test the HIT in comparison with other, well validated and established measures commonly used in conjunction with risk assessment, such as the PCL-R and the HCR-20 (Webster, Douglas, Eaves & Hart, 1997) to test the incremental validity of self-serving cognitive distortions as a dynamic risk factor.

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Table 1

*Demographic Characteristics of the Study Groups (percentages)*

	Adults		Adolescents	
	Non-inc (n=60)	Inc (n=56)	Non-inc (n=190)	Inc (n=58)
<u>Gender</u>				
Male	100	100	57.4	50.0
Female	0	0	42.6	50.0
<u>Age group (years)</u>				
13-15	0	0	62.1	50.0
16-18	0	0	37.9	50.0
19-21	86.7	3.6	0	0
22-24	13.3	12.5	0	0
25-34	0	25.0	0	0
35-39	0	17.9	0	0
40-44	0	21.4	0	0
45-58	0	19.6	0	0
<u>Highest education</u>				
No formal education	0	1.8	-	-
Compulsory school	0	39.3	-	-
Upper				
secondary/vocational	0	50.0	-	-
University	100	8.9	-	-

*Note.* Non-inc = Non-incarcerated group, Inc = Incarcerated group

	Adults		Adolescents	
	Non-inc (n=60)	Inc (n=56)	Non-inc (n=190)	Inc (n=58)
<u>Previous criminality</u>				
Yes	5.0	100	-	-
No	95.0	0	-	-
<u>Number of previous convictions</u>				
1	-	14.3	-	-
2-3	-	14.3	-	-
4-7	-	16.1	-	-
8 or more	-	55.4	-	-
<u>Criminal versatility</u>				
0-3 different crimes	-	41.1	-	-
4-5 different crimes	-	26.8	-	-
6 or more different crimes	-	32.1	-	-

*Note.* Non-inc = Non-incarcerated group, Inc = Incarcerated group

Table 2

*The Internal Consistency of the Total HIT Scale and Sub Scales (Cronbach's alpha)*

Scale	Adults		Adolescents	
	Non-inc (n=60)	Inc (n=56)	Non-inc (n=190)	Inc (n=58)
HIT total	.90	.94	.95	.96
Self-Centered	.72	.84	.81	.90
Blaming Others	.62	.78	.79	.85
Minimizing/Mislabeled	.71	.79	.82	.89
Assuming the Worst	.76	.83	.85	.87
Opposition-Defiance	.71	.73	.77	.80
Physical Aggression	.82	.86	.87	.92
Lying	.61	.83	.78	.82
Stealing	.81	.93	.89	.93
Anomalous Responding	.80	.64	.78	.77
Positive Fillers	.34	.66	.79	.62

*Note.* Non-inc = Non-incarcerated group, Inc = Incarcerated group

Table 3

*Mean and Standard Deviation on the HIT Scales for the Study Groups*

Scale	Adults		Adolescents	
	Non-inc (n=60)	Inc (n=56)	Non-inc (n=190)	Inc (n=58)
HIT total	1.88 (0.46)	2.72 (0.90)	2.23 (0.79)	3.88 (1.21)
Self-Centered	1.99 (0.61)	2.91 (1.08)	2.32 (0.86)	3.83 (1.36)
Blaming Others	1.83 (0.48)	2.70 (0.91)	2.24 (0.84)	3.88 (1.23)
Minimizing/Mislabeled	1.99 (0.62)	2.75 (1.01)	2.18 (0.90)	3.74 (1.41)
Assuming the Worst	1.65 (0.44)	2.50 (0.89)	2.11 (0.83)	4.08 (1.18)
Opposition-Defiance	2.05 (0.62)	2.82 (0.85)	2.39 (0.82)	3.56 (1.08)
Physical Aggression	1.65 (0.56)	2.55 (1.04)	2.03 (0.92)	4.09 (1.45)
Lying	2.43 (0.58)	2.93 (1.05)	2.75 (0.93)	3.61 (1.22)
Stealing	1.45 (0.49)	2.57 (1.19)	1.81 (0.88)	4.22 (1.44)
Anomalous Responding	3.72 (0.95)	4.22 (0.78)	3.67 (0.99)	2.45 (0.93)
Positive Fillers	5.27 (0.37)	5.12 (0.71)	5.29 (0.73)	1.58 (0.62)

*Note.* Non-inc = Non-incarcerated group, Inc = Incarcerated group



Table 4

*Correlations between the HIT scales and antisocial behavior (Spearman's rho) for all adults (n = 116)*

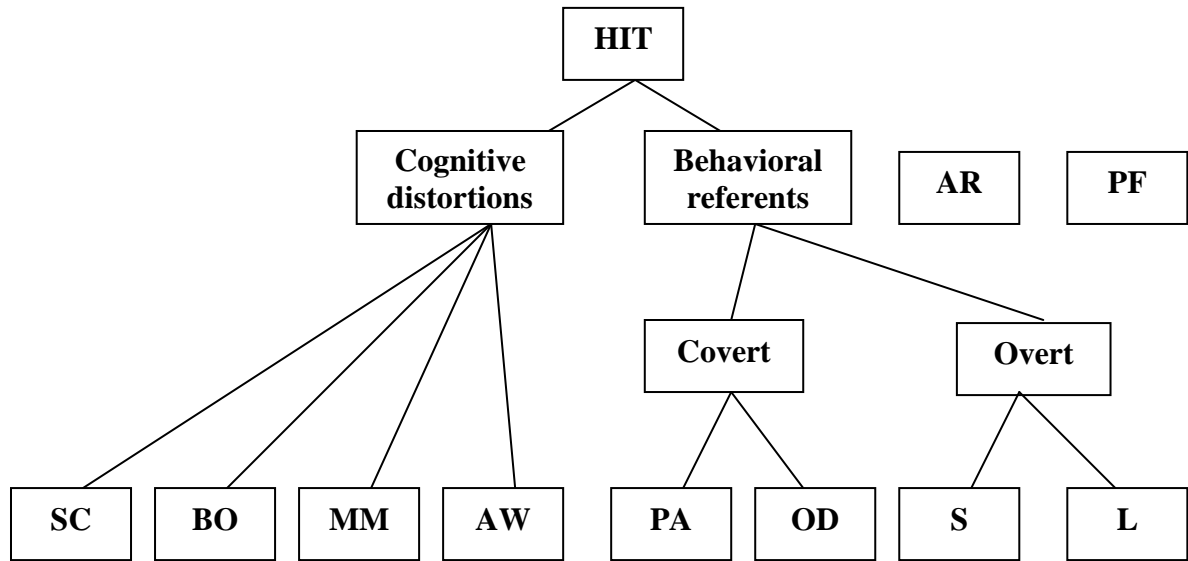
Scale	SCID tot	SCID CD	SCID ASPD
HIT total	.61	.62	.52
Self-Centered	.56	.56	.47
Blaming Others	.60	.61	.50
Minimizing/Mislabeling	.53	.53	.45
Assuming the Worst	.58	.58	.50
Opposition-Defiance	.60	.63	.50
Physical Aggression	.58	.61	.46
Lying	.40	.42	.33
Stealing	.57	.55	.50
Anomalous Responding	.39	.37	.36
Positive Fillers	ns*	ns*	ns*

*Note.* SCID tot = the total measure of antisocial behavior, SCID CD = the measure of antisocial behavior during childhood (conduct disorder), SCID ASPD = the measure of antisocial behavior during adulthood (antisocial personality disorder)

*ns\** =  $p > 0.05$ , all other values significant at  $p < .001$

Figure Caption

*Figure 1.* The theoretical structure of How I Think.



*Note.* SC = Self-Centered, BO = Blaming Others, MM =Minimizing/Mislabeled, AW = Assuming the Worst, PA = Physical Aggression, OD = Opposition-Defiance, S = Stealing, L = Lying, AR = Anomalous Responding, PF = Positive Fillers

Figure Caption

*Figure 2.* A three-factor model for the HIT questionnaire (Fit: N=364,  $\chi^2 = 2115,981$   $df=$   
1374,  $p < .0001$ ,  $(2115, 98 / 1374=1.5)$ ; RMSEA=.04.).

