Clarifying the relationship between temperament and antisocial behavior

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Abstract

This literature review discusses the relationship between temperament and antisocial behavior. The main goal of this study is to clarify this relationship, and to create an overview of the different temperamental traits that have been related to the development of antisocial behavior. First, the construct of temperament is explained, as well as the concept of antisocial behavior. Then, the temperamental traits related to antisocial behavior are classified into 3 major theories of temperament. This classification, in turn, enables the composition of a general temperamental profile, including the traits that place children at most risk for developing antisocial behavior. The temperamental traits that fit this profile are low Effortful Control or Lack of Control, and high Negative Affect or Emotionality (more specifically, high Frustration and low Fear).

Keywords: temperament, temperamental traits, antisocial behavior, temperamental profile.

Introduction

It is often said that every individual is unique. These individual differences are already manifested early in development (de Pauw & Mervielde, 2010): some children are outgoing, whereas others stay in the background; some children respond aggressively, whereas others react more gently. These individual characteristics of children and adolescents can be broadly described as 'temperament'. Since the 1960's, researchers have studied the structure of temperament and meaning of temperamental differences in children. However, there is still not much consensus regarding the construct of temperament. Discussion exists on the model that best captures the key aspects of temperament and the best way to measure it. Many theories of temperament have been proposed and even today, consensus on a precise definition of temperament is yet to be reached (de Pauw & Mervielde, 2010). A possible definition of temperament is 'the constitutionally based individual differences in emotional, motor, and attentional reactivity and self-regulation' (Rothbart & Bates, 1998, p.109).

In this study, temperament will be studied in relation to antisocial behavior. Antisocial behavior (also referred to as ASB) has many manifestations and different underlying intentions (Giancola, Mezzich & Tarter, 1998) and can therefore be defined in multiple ways. A possible definition of antisocial behavior is 'the expression of behaviors that are typically considered to be delinquent (e.g. vandalism or stealing) or verbally or physically aggressive' (Giancola, Mezzich & Tarter, 1998, p.629). Many researchers have wondered if antisocial behavior in adolescents and adults can be traced back to childhood, and thus, could be related to temperament styles or traits. Research indeed confirmed that certain temperament styles and many temperamental traits are related to the development of later antisocial behavior.

However, little structure exists in the literature on this subject, probably because temperament and antisocial behavior are both such broad concepts. Studies that focus on the relationship between temperament and antisocial behavior often use different definitions or theories of temperament and antisocial behavior, and they all seem to focus on different temperamental traits.

As a result, overview is easily lost when reading into the relationship between temperament and antisocial behavior. This absence of structure in the current literature obstructs an understanding of the relationship between temperament and antisocial behavior as a whole. Therefore, the goal of this review is to clarify the relationship between temperament and antisocial behavior. It will start by giving an overview of the definitions and most important theories of temperament, and by explaining the concept of antisocial behavior. Furthermore, an attempt has been made to classify the temperamental traits that are related to the development of antisocial

behavior, into one of three major temperament theories. This classification will facilitate the composition of a general temperamental profile, including traits that are found to be most strongly related to the development of antisocial behavior.

Method

The literature used in this study was found by searching several databases of the Tilburg University library. The first database searched was PsycARTICLES. The search term 'temperament AND antisocial' in all fields yielded 21 results, of which 3 were selected for this study based on recency and content relevance:

Giancola, P., Mezzich, A., & Tarter, R. (1998). Executive cognitive functioning, temperament, and antisocial behavior in conduct-disordered adolescent females. *Journal of Abnormal Psychology, 107 (4)*, 629-641.

Henry, B., Caspi, A., Moffitt, T., & Silva, P. (1996). Temperamental and familial predictors of violent and nonviolent criminal convictions: age 3 to age 18. *Developmental Psychology, 32 (4),* 614-623.

Giancola, P. (2000). Temperament and antisocial behavior in preadolescent boys with or without a family history of substance use disorder. *Psychology of Addictive Behaviors, 14 (1),* 56-68.

The second database searched was PsycINFO. The search term 'temperament AND antisocial behavior IN title yielded 8 results, of which 2 were selected for this study based on recency and content relevance:

Veenstra, R., Lindenberg, S., Oldehinkel, A., de Winter, A., & Ormel, J. (2006). Temperament, environment, and antisocial behavior in a population sample of preadolescent boys and girls. *International Journal of Behavioral Development, 30 (5),* 422-432.

Dadds, M., & Salmon, K. (2003). Punishment insensitivity and parenting: temperament and learning as interacting risks for antisocial behavior. *Clinical Child and Family Psychology Review, 6(2)*, 69-86.

In the same database, the search term 'temperament AND antisocial behavior', between 2001 and 2011, yielded 192 results, of which 5 were selected for this study based on recency and content relevance:

Pitzer, M., Esser, G., Schmidt, M., & Laucht, M. (2010). Early predictors of antisocial developmental pathways among boys and girls. *Acta Psychiatrica Scandinavica, 121,* 52-64.

De Pauw, S., & Mervielde, I. (2010). Temperament, personality and developmental psychopathology: a review based on the conceptual dimensions underlying childhood traits. *Child Psychiatry and Human Development, 41,* 313-319.

Muris, P., Meesters, C., & Blijlevens, P. (2007). Self-reported reactive and regulative temperament

in early adolescence: relations to internalizng and externalizing problem behavior and “BigThree” personality factors. *Journal of Adolescence, 30,* 1035-1049.

Frick, P., & Morris, A. (2004). Temperament and developmental pathways to conduct problems. *Journal of Clinical Child and Adolescent Psychology, 33 (1),* 54-68.

Schmeck, K., & Poustka, F. (2001). Temperament and disruptive behavior disorders. *Psychopathology, 34,* 159-163.

Also in this database, the search term 'temperament AND delinquency IN title' was used. This yielded 4 results, but none of these were selected for this study.

In the database 'Psychology and behavioral sciences collection', the search term 'temperament AND criminal' yielded 10 results, of which 1 was selected for this study based on recency and content relevance:

Kemp, D., & Center, D. (2000). Troubled children grown-up: antisocial behavior in young adult criminals. *Education and treatment of children, 23 (3),* 223-238.

Using the 'Get it!' search function on the Tilburg University library page, the search term 'conduct problems' AND 'review', between 2000 and 2009, yielded 56 results, of wich 1 was selected for this study based on recency and content relevance:

Kiel, V., & Price, M. (2006). Externalizing behaviors in child welfare settings: definition, prevalence, and implications for assessment and treatment. *Children and Youth Services Review, 28 (7),* 761-779.

In the 'Online Contents Landelijk' database, the search term 'conduct problems' in title AND 'review' in all fields yielded 12 results, of which 1 was selected for this study based on recency and content relevance:

Ehrensaft, M. (2005). Interpersonal relationships and sex differences in the development of conduct problems. *Clinical Child and Family Psychology Review, 8 (1),* 39-63.

The remaining literature used for this study was found by searching the references of the aforementioned articles.

Results

What is temperament?

Before looking into the relationship between temperament and antisocial behavior, it is important to first clarify the construct of temperament. Troughout the years, temperament has been defined many times in many different ways. The term temperament originated in the middle ages from the ancient idea of the 'humours', glandular secretions that were believed to determine one's temperament (Dadds & Salmon, 2003).

Definitions of temperament

In 1961, Gordon Allport made one of the most extensive attempts to define character, personality, and temperament, and to distinguish between these three terms. According to Allport, temperament refers to 'the characteristic phenomena of an individual's emotional nature, including his susceptibility to emotional stimulation, his customary strength and speed of response, the quality of his prevailing mood, and all pecularities of fluctuation and intensity in mood, these phenomena being regarded as dependent upon consitutional make-up, and therefore hereditary in origin' (Dadds & Salmon, 2003, p.75).

Another well-known definition of temperament was proposed by Thomas and Chess in 1977. They stated that temperament is 'a latent construct comprising a series of trait dimensions depicting individual differences in various types of behavioral and affective responsivity and self-regulatory styles'.(Giancola, 2000, p.56). An example of those dimensions is the degree of regularity in performing various behavioral activities and biological functions.

Acccording to Cloninger and Svrakic's psychobiological theory of personality, which originates in 1997, temperament reflects 'the basic organization of independently varying brain systems for the activation, maintenance and inhibition of behavior in response to stimuli, and includes basic emotional response patterns' (Schmeck and Poustka, 2001, p.159-160).

Rothbart and colleagues also defined temperament, describing it as 'the constitutionally based individual differences in emotional, motor, and attentional reactivity and self-regulation' (Rothbart & Bates, 1998, p.109). These differences appear early in childhood and are relatively stable over time (Martel et al., 2008). The reactive aspects of temperament include onset, duration, and intensity of expression of affective reactions (positive and negative), and also the variability in arousability and distress in response to stimulation, activity, and attention. These aspects of temperament are thought to shape the self-regulatory processes, such as executive control of attention. (Dadds & Salmon, 2003).

Recently, several attempts have been made to formulate a general definition of temperament. For instance, Schmeck and Poustka (2001) believe that temperament can be defined as 'early-developing individual behavior tendencies that are biologically rooted, present from infancy onward, relatively stable over time and situations, and are manifested in the context of social interaction' (2001, p.159). According to Mash and Wolfe (2010), temperament 'refers to the child's organized style of behavior that appears early in development, which shapes the child's approach to his or her environment and vice versa' (p.45).

Key components of temperament

Today, a precise definition of temperament is still a subject of debate, but consensus grows around the following key components of temperament: that it has a manifestation from infancy

onward, and that it is relatively consistent across situations and time. Also, most researchers seem to agree that temperament consists of several dimensions of traits that influence behavior, and that these traits form the foundation for later developing personality (De Pauw & Mervielde, 2010).

The most important theories of temperament

Given the fact that there are many definitions of temperament, it is not surprising that there are also many theories of temperament. Three of these theories, that are well-known and often referred to, will be discussed in this study. These major theories include a theoretical framework by Thomas and Chess, Buss and Plomin's criterial approach, and Rothbart's psychobiological theory (de Pauw et al., 2010).

Thomas and Chess

Thomas and Chess developed their theoretical framework of temperament in the late 1950's. In this framework they viewed temperament as the *how* of behavior, thus emphasizing behavioral styles of children. Analysis of these behavioral styles led them to identifying nine dimensions, that seemed to have significance for psychological development: physical activity, regularity of the child's behavior (rhythmicity) , adaptability to the environment, approach/withdrawal in response to novelty, threshold of responsiveness to stimulation, intensity of the reaction, quality of mood in terms of positive/negative feelings, distractibility, and task persistence (De Pauw et al., 2010). These nine dimensions enabled Thomas and Chess to distinguish between three types of children, based on characteristics that clustered together (Berk, 2008). The first type is the 'easy child', characterized by easily establishing regular routines in infancy, being generally cheerful and adapting easily to new experiences. The 'slow-to-warm-up-child', the second type, is inactive (i.e. showing mild, low-key reactions to environmental stimuli), negative in mood, and adjusts slowly to new experiences. Children that fit the third type, the so-called 'difficult child', are irregular in their behavior and biological functions, show high activity, as well as intense reactions to different types of stimuli, tend to withdraw from novelty, have affective states that are characterized by a lot of irritability and other aspects of negative mood, do not adapt well to changes in their environment, and have problems persisting in tasks that require sustained attention (Frick & Morris, 2004). The latter type has been of the most interest to researchers, because having a difficult temperament seems to place children at high risk for adjustment problems (Berk, 2008).

Buss and Plomin

The second major theory, the criterial approach by Buss and Plomin, modifies Thomas and Chess's model by viewing temperament as an antecedent of adult personality, and thereby defining temperament as early appearing, heritable aspects of personality (de Pauw et al., 2010). According to this theory, a trait must have five features in order to be considered as a temperamental trait. It must be 'inherited, relatively stable during childhood, retained into adulthood, evolutionary

adaptive, and present in our phylogenetic relatives' (, 2010, p.317). Based on these criteria, Buss and Plomin proposed four broad dimensons of temperament: emotionality, activity, sociability and impulsivity. Emotionality refers to a predisposition to get easily distressed and upset. The "total activity level refers to the total energy output" (Buss & Plomin, 1975, p.32-33). Sociability "is the tendency to prefer presence of others to being alone" (Buss & Plomin, 1984, p.63). Later on, impulsitivy was eliminated because of inconsistent findings regarding the heritability feature (de Pauw et al., 2010).

Rothbart

The third major theory of temperament is Rothbart's psychobiological theory. According to Rothbart, individuals do not just differ in their reactivity on each of the temperament dimensions as described by Thomas and Chess, but also in their effortful capacity to manage that reactivity. This self-regulatory dimension of temperament is called effortful control. It involves involuntarily suppressing a dominant, reactive response in order to plan and execute a more adaptive response (Berk, 2008). A fundamental assumption of Rothbart's theory is that temperamental differences are largely determined by the responsiveness of underlying psychobiological processes (De Pauw et al., 2010, p.317). Hence, reactivity refers the physiological excitability of neural systems, while self-regulation encompasses the processes that enable adapting that excitability. Factor analyses showed that the structure of temperament can be covered by at least three broad dimensions; Negative Affect, Surgency and Effortful Control. Negative Affect reflects a general tendency to experience negative emotions like fear and frustration. Surgency encompasses social orientation, certain aspects of motor activity, and the experience of positive emotion. Effortful Control includes inhibitory control and attentional focusing. Negative Affect and Surgency are mostly linked to reactivity processes, while Effortful Control is mostly linked to regulation processes (de Pauw et al., 2010).

Overlapping dimensions of temperament

Each of these three theories is based on, or seems to overlap at least some parts of another theory. Several researchers recognized this overlap, and attempted to identify common and general dimensions of temperament. For instance, Mervielde and Asendorpf (2000) proposed that there are at least 4 dimensions needed to capture the content of these prominent theories. Clearly present in each theory is the dimension of Emotionality, capturing the tendency to experience emotions, and negative affect in particular. Another consistent dimension is Extraversion, which refers to sociability versus social inhibition. The third dimension is Activity, which is comparable to Rothbart's Surgency dimension. Emerging as a fourth dimension is Persistence (i.e. Effortful Control).

Rothbart, Ahadi, and Evans (2000) also reviewed several psychobiological models and

identified 5 basic temperamental systems: Approach and Positive Affect (related to Extraversion); Fear (behavioral inhibition in particular); Anger/Frustration, Reactive Orienting (i.e. directing attention to relevant locations), and Effortful Control. Further, factor analyses of a measure of child temperament (the Children's Behavior Questionnaire) consistently found three temperamental factors. The first factor was Extraversion/Surgency, defined by subscales of approach, high-intensity pleasure or sensation seeking, and activity level. The second factor was Negative Affectivity, which was defined by subscales of discomfort, fear, anger or frustration and sadness. The third factor was Effortful Control, defined by scales of inhibitory control, attentional focusing, low-intensity pleasure and perceptual sensitivity (Rothbart et al., 2000; Dadds & Salmon, 2003).

What is antisocial behavior?

Now that the construct of temperament has been clarified and the major theories on this subject have been explained, it is time to take a closer look at the second construct that is central to this study: antisocial behavior. As discussed earlier, antisocial behavior (also referred to as ASB) can be broadly defined as 'the expression of any behaviors typically considered to be delinquent (e.g. vandalism, stealing) or verbally or physically aggressive' (Giancola, Mezzich & Tarter, 1998, p.629). It is often seen as a consequence of an extreme tendency to seek stimulating experiences, combined with an inability to delay gratification (Saltaris, 2002). Antisocial behavior clearly is a broad construct that has many manifestations, which makes it difficult to define. Consequently, several other terms that have great overlap with antisocial behavior, are often used in the current literature; most seen are the terms 'externalizing problems' and 'conduct problems'. According to Keil and Price (2006), externalizing problems are characterized as being overt, disruptive, and often involving the violation of societal norms, destruction of property, and harm towards others. Finding a definition for conduct problems was very difficult. Ehrensaft (2003) describes it as an umbrella structure that includes variations of aggressive behavior, delinquency, conduct disorder, oppositional defiant disorder, and antisocial behavior.
According to Liu (2004), terms like antisocial behavior, externalizing problems, and conduct problems are practically synonymous, although some authors like to believe that a distinction in severity could be made: externalizing problems are less severe in nature than antisocial behavior (e.g. Shaw & Winslow, 1997). However, consensus on this topic has not been reached. Therefore, in order to maintain structure in this review, the term 'antisocial behavior' will be used as a synonym for terms like 'conduct problems' or 'externalizing problems'.

It goes without saying that antisocial behavior in children and adolescents is an important subject to study. Not only because of the problems it can cause for the environment of the child or adolescent, but also for the child or adolescent itself. Antisocial behavior is known to have several

long-term effects on a child or adolescent, more specifically on educational achievement, peer-relationships, drug abuse and adult outcome (i.e. chronic criminal behavior or health burden) (Pitzer, Esser, Schmidt & Laucht, 2009). Therefore, prevention and intervention in this area is crucial. To enable this, identification of distinct developmental pathways of antisocial behavior in childhood and adolescence has been an important focus of research. Major work on this subject has been done by Moffitt, in 1993. He differentiates between life-course persistent (LCP) and adolescence-limited (AL) antisocial behavior. The first type starts early in childhood, as a result of neurodevelopmental impairments that, in turn, lead to an undercontrolled temperament. The second type seems to develop mostly through affililation with deviant peers. (Pitzer et al., 2009). In their study, Pitzer et al (2009) identified a third type of antisocial behavior: the childhood-limited (CL) antisocial behavior, which contains children who display antisocial problems only in childhood.

What relationships are found between temperament and antisocial behavior?

Many relationships between temperamental traits and antisocial behavior have been proposed in previous literature. In this paragraph, an attempt has been made to categorize these relationships in accordance with the three major theories of temperament discussed earlier.

Thomas and Chess's theory of temperament in relation to antisocial behavior

Regarding the three types of temperament that Thomas and Chess developed, it is not very surprising that children who fit the 'difficult type' seem to be at most risk for antisocial behavior (Giancola et al., 1998; Frick & Morris, 2004; Moffitt & Caspi, 2001). According to Giancola et al. (1998), conduct disordered adolescent girls show significantly greater difficult temperament than girls without conduct disorder. They also found that a difficult temperament is more strongly related to nonaggressive antisocial behavior (behavior that does not include physical aggression, e.g. stealing or frequent truancy) than to aggressive antisocial behavior. Moffitt and Caspi (2001) found that having a difficult temperament, which in their study is measured by fighting, peer rejection, hyperactivity, and difficulty to manage the child, is associated with an early onset of antisocial behavior.

Although many studies about the relationship between temperament and antisocial behavior focus mainly on the dimension of difficult temperament, looking at the more specific traits (dimensions) of temperament that were proposed in Thomas and Chess' theory may provide a clearer explanation of how temperament is related to antisocial behavior. For instance, according to Giancola (2000), individuals with low Rhythmicity are more aggressive and display more delinquency than individuals with high Rhythmicity, especially when low Rhythmicity is combined with either low behavioral regulation or low positive affectivity. Giancola states that it is possible that this combination produces a psychological state characterized by Negative Affect (which will

be discussed below). Since the experience of negative affect is known to activate aggression- or fear-related cognitions, feelings, and expressive reactions, this could serve as the catalyst for antisocial behavior (Giancola, 2000).

The results of a study by Pitzer et al. (2009) showed that girls with adolescence-onset antisocial behavior scored higher on the temperamental trait of easiness, which represents aspects of Approach and Adaptability. This trait has been related to nigher novelty seeking in later life. Indeed, Schmeck and Poustka (2001) found that scoring high on novelty seeking places individuals at risk for antisocial behavior. According to Pitzer et al.(2009), an explanation for this relationship is that high novelty seeking facilitates the affiliation to deviant peers and the copying of risk behavior that is apparent in adolescence-onset antisocial behavior.

Buss and Plomin's theory of temperament in relation to antisocial behavior

Buss and Plomin's theory of temperament contains one dimension that has specifically been related to antisocial behavior. De Pauw and Mervielde (2010) found a positive link between Emotionality and antisocial behavior. Both the experience of negative emotions (negative emotionality and negative emotional reactivity), as well as an absence of positive emotions (low positive affectivity) have been found to be a risk factor for antisocial behavior (Martel et al., 2009; Frick & Morris, 2004; Giancola, 2000). Specific (negative) emotions that are important in this relationship have been identified. For instance, a positive association between frustration and antisocial behavior was found (Veenstra, Lindenberg, Oldehinkel, de Winter & Ormel, 2006; Muris et al., 2007; Oldehinkel, Hartman, de Winter, Veenstra & Ormel, 2004), as well as a positive asssociation between anger-irritability and antisocial behavior (Frick & Morris, 2004; Muris et al., 2007; de Pauw & Mervielde, 2010). These emotions are core features of (reactive) aggression (de Pauw & Mervielde, 2010), which could explain why they have been related to antisocial behavior.

Rothbart's theory of temperament in relation to antisocial behavior

Rothbart's theory of temperament is often used in research on the link between temperament and antisocial behavior. Consequently, the dimensions Rothbart proposed can certainly be related to antisocial behavior. The first dimension, Negative Affect, clearly overlaps the aforementioned Emotionality dimension of Buss and Plomin. An interesting finding regarding this dimension in particular, is that high Negative Affect was associated with a greater probability of maladaptation, leading to later antisocial behavior (Oldehinkel et al., 2004). More specifically (as mentioned above), research showed that the experience of anger is positively associated with antisocial behavior (Frick & Morris, 2004; Muris et al., 2007), perhaps because engaging in antisocial behavior is a way to release the child's frustration. The experience of fear is also positively associated with antisocial behavior, and it appears to be indicative for the severity of the behavior

(Frick & Morris, 2004; Oldehinkel et al., 2004). It could be, similar to an angry child, that a highly fearful child will resort to antisocial behavior in order to release the emotion it experiences and thereby empower itself. Interestingly, a temperament style of fearlessness is related to antisocial behavior as well (Saltaris, 2002). Dadds & Salmon (2003) confirm that low fear experience can place one at risk for antisocial behavior. An explanation they give for this is that fear can serve as a control system. When the experience of fear is absent, there are no constraints on the expression of negative emotions and risky behaviors (like antisocial behavior).

The second dimension is Surgency. High scores on this temperamental dimension (i.e. having low shyness and high physical activity) would be indicative of a risk of antisocial behavior (Oldehinkel et al., 2004). This corresponds with findings from Kemp and Center (2000), who state that scoring high on Eysenck's Extroversion scale (similar to high Surgency) is related to later antisocial behavior. When Surgency is high, the child is very active and not shy in interactions with others. This child probably has a lot of energy that it wants to release, and when this is not managed well by the child's environment, it is quite imaginable that the child will engage in antisocial behavior out, partly out of frustration.

The third dimension, Effortful Control, is by far the most discussed temperamental aspect in relation to antisocial behavior. According to Frick and Morris (2004), Effortful Control is an important process involved in the temperamental trait Emotion Regulation. It contains elements of shifting attention, focusing, and inhibitory control. Individuals with low Effortful Control experience negative emotions intensely. They are also less likely to consider possible consequences of their actions, which makes it difficult for them to restrain undesirable urges in response to these emotions. Therefore, Effortful Control is known to be negatively associated with antisocial behavior (Eisenberg, Guthrie, Fabes, Shepard, Losoya & Murphy et al, 2000; Eisenberg, Cumberland, Spinrad, Fabes, Shepard, Reiser et al., 2001; Dadds & Salmon, 2003; Oldehinkel et al., 2004; Veenstra et al., 2006; Muris et al., 2007; de Pauw & Mervielde, 2010), even after accounting for the influence of psychosocial risk factors (Pitzer et al., 2009). The opposite of Effortful Control, a trait named lack of Control, is also related to antisocial behavior. Lack of Control is characterized by emotional lability, restlessness, lack of emotional regulation, and negativism (Saltaris, 2002). It is imaginable that a child that experiences the world in a negative manner and does not have the resources to regulate these negative emotions, will resort to antisocial behavior in order to release the negativity experienced. A study by Henry, Caspi, Moffitt, and Silva (1996), for example, showed that this trait could even be predictive of criminal convictions: its results showed that individuals who were convicted for a violent crime had higher levels of Lack of Control than nonconvicted individuals.

Additional temperamental traits related to antisocial behavior

Some of the temperamental traits that have been related to antisocial behavior could not readily be divided into one of the three major theories. These traits will nevertheless be discussed briefly.

A number of studies have focused on temperamental traits involving reward and punishment. Cloninger and Svrakic (1997) theorize that individuals with low Reward Dependence are at increased risk for the development of antisocial behavior. These individuals are characterized as being aloof and insensitive to social cues. They maintain previously rewarded behavior even when the reinforcement is not continued (Cloninger & Svrakic, 1997), which could make them rather insensitive to what others feel has become undesirable behavior. This can lead to the display of antisocial behavior, that does not stop when reinforcement fails. Findings by Schmeck and Poustka (2001) confirm this; they found that individuals with antisocial personality disorder displayed a low Reward Depencence.

According to Dadds and Salmon (2003), a high score on Reward Seeking (which would contrast with a low Reward Dependence) is also related to antisocial behavior, as well as Punishment Insensitivity. This is characterized by low arousal, a high reward drive, and deficits in attention, avoidance learning, and recognising and responding to non-angry negative emotions. Punishment Insensitivity will affect the socialization process of the child negatively, because the child will be very difficult to discipline. This could lead to a cycle of aversive parent-child interactions that will only worsen the antisocial behavior. (Dadds & Salmon, 2003).

Scoring low on the temperamental trait of Harm Avoidance was also found to be a risk factor for antisocial behavior (Schmeck & Poustka, 2001). Harm Avoidance consists of a behavioral inhibition in response to punishment or nonreward. When Harm Avoidance is low, the child will not respond inhibited in response to punishment, and therefore will be difficult to discipline. The tendency to experience little anxiety or fear, which is also present in children with low Harm Avoidance, will only increase the risk for antisocial behavior. (Cloninger & Svrakic, 1997; Schmeck & Poustka, 2001; Dadds & Salmon, 2003).

Conclusion & Discussion

The findings described earlier clearly show that temperament and antisocial behavior are related. Having a difficult temperament in general is a risk factor for antisocial behavior, but more specific temperamental traits can also be identified. The current literature discusses many different traits related to antisocial behavior, although some were more represented than others. The most important temperamental traits can be incorporated in a temperamental profile that is most strongly related to antisocial behavior. This profile includes the temperamental traits of low Effortful Control

or Lack of Control, and high Negative Affect or Emotionality (more specifically, high Frustration and/or low Fear).

Temperamental pathways to antisocial behavior

Determining that there is a relationship between temperament and antisocial behavior is easy, but explaining how this relationship works precisely is much more difficult. Several researchers have proposed different pathways in which temperamental traits can lead to antisocial behavior.

For example, findings by Henry et al. (1996) suggest that there is a pathway in which early behavioral difficulties that result from temperamental traits, stimulate a developmental process that places the child at risk for antisocial behavior. More specifically, children who experience negative emotions intensely (high Negative Affect) and have trouble regulating these emotions (Lack of Control), will be easily aroused and prone to temper tantrums and aggressive outbursts. This will eventually lead to the development of antisocial behavior (Eisenberg & Fabes, 1992). The antisocial behavior displayed by these children is often more severe and is more expected to continue into adulthood, compared to another pathway in which a child functions well throughout childhood, and engages in relatively mild forms of antisocial behavior in adolescence, perhaps in response to environmental pressures (Henry et al., 1996).

More recently, Nigg (2006) also discussed distinct temperamental pathways to antisocial behavior. One pathway involves the temperamental traits of low Fear and low Affiliation. Low Fear in early childhood may limit the development of guilt, conscience, and sensitivity to punishment or socialization. The low levels of Affiliation that result from this lead to behaviors that amplify the pathway to antisocial behavior. This pathway was also described by Frick and Morris (2004).

Another pathway Nigg describes involves high Approach, Negative Affect and low Effortful Control. A child with high Approach is very reward-seeking and sensation seeking, and could engage in antisocial behaviors because it disregards social rules and the rights of others. When a child scores high on Negative Affect and low on Effortful Control, it experiences a lot of negative emotions and has difficulty regulating these emotions. All this can lead to defiance and aggression, which, in turn, will elicit negative parent-child interactions and result in antisocial behavior.

According to Veenstra et al. (2006), the relationship between temperament and antisocial behavior can mainly be explained by the temperamental trait of high Frustration combined with so-called goal-blocking. They state that when highly-frustrated children fail at reaching a goal (i.e. their goal is blocked), they easily experience irritation and anger. As a result, these children are prone to externalizing their frustration and, ultimately, engaging in antisocial behavior (Kochanska et al., 2000, Rothbart & Putnam, 2002).

Mediators

Although temperament clearly has an influence on the development of antisocial behavior, temperament alone does not account for the full emergence of it (Nigg, 2006). Research has shown that extreme temperament leads to psychopathology only in a minority of cases (Kagan & Snidman, 2004). Therefore, mediators that occur during development should also be identified in the relationship between temperament and antisocial behavior (Nigg, 2006).

Child characteristics

Certain child characteristics can mediate the relationship between temperament and antisocial behavior. For example, Kemp and Center (2000) discuss research findings by Eysenck and Gudjonsson (1989), according to which a child with below average intelligence, in combination with a difficult temperament, will have an increased likelihood of an antisocial outcome. These children are likely to fail at school tasks and thus experience a higher level of frustration and stress, which will increase risk of antisocial behavior. Giancola et al. (1998) found that low executive functioning was a mediator in the relationship between difficult temperament and aggressive antisocial behavior. Impaired executive functioning may increase risk for antisocial behavior because it comes with lower behavioral inhibition and an impaired ability to form appropriate (nonaggressive) behavioral responses to provocative situations (Giancola, 1995). Another interesting finding is that boys seem to have increased risk for developing antisocial behavior (i.e. Veenstra et al., 2006). This could be explained by their higher activity level and tendency to approach novel situations compared to girls (Oldehinkel et al., 2004). Boys also have less preference for close interpersonal relationships (Rose & Rudolph, 2006) and tend to focus more on themselves and less on others (Feingold, 1994). For all these reasons, boys are more at risk of developing antisocial behavior (Shaw, Winslow, Owens, Vondra, Cohn & Bell, 1998), so sex could also be identified as a mediator in the relationship.

Environment characteristics

The environment in which the child is reared , was found to be important in the development of antisocial behavior. Henry et al. (1996) stated that antisocial behavior does not only originate from a combination of a lack of self-regulation, but also from a lack of social regulation. Indeed, affective ties between children and caregivers (i.e. attachment) were found to be relevant for the development of antisocial behavior (Saltaris, 2002) Also, aversive parenting styles seem to affect the risk for antisocial behavior (Dadds & Salmon, 2003), especially when the parents display characteristics like overprotection and rejection (Veenstra et al. (2006). In other words, the child may be sensitive to the display of antisocial behavior because of a certain temperament style, but

when the parents do not manage this sensitivity correctly, they can further increase the child's risk for an antisocial outcome. Finally, cumulative family adversity (e.g. crowded living conditions, early/single parenthood, or a family history of delinquency) and a low SES may increase risk for the development of antisocial behavior (Pitzer et al., 2009;Veenstra et al., 2006). An explanation given by Pinderhughes, Bates, Dodge, Petit, and Zelli (2000) is that when parents have a lower SES, they have fewer cultural and educational resources to deal with children's problem behavior. Families that already face many adversities will probably also lack these resources.

Further research

A recommendation for further research would be to study more extensively how all these characteristics, temperament included, come together in the development of antisocial behavior. Many studies focus only on a few of these characteristics, or only on certain elements of temperament. A more complete study of developmental pathways from temperamental profiles to antisocial outcomes, one that takes into account the aforementioned mediators, would be useful in further clarifying the relationship between temperament and antisocial behavior.

Another recommendation is to further specify the gender differences found by, for instance, Veenstra et al (2006). Research has, for example, shown that boys and girls differ in their expression of antisocial behavior (Pitzer et al., 2009). Therefore, it is possible that a distinction between temperamental profiles or pathways for boys and girls could even be made.

Further study of the concept of psychopathy in relation to antisocial behavior is also recommended. Research has shown that the display of antisocial behavior in childhood or adolescence could be predictive of adult psychopathy (e.g. Saltaris, 2002). Relationships with temperament have also been proposed. Saltaris (2002), for instance, found that a temperament style of fearlessness is related to the development of psychopathy. As discussed earlier, this trait is also related to the development of antisocial behavior. Therefore it would be interesting to study and clarify the differences between temperamental pathways to antisocial behavior and temperamental pathways to psychopathy.

Finally, research on temperament and antisocial behavior should ultimately focus on providing help to children who are at most risk for antisocial outcomes, and thereby preventing these outcomes from occurring. Therefore, further research should start focusing not only on understanding of the relationship between temperament and antisocial behavior fully, but also on the identification and development of effective interventions for the children who are at most risk for developing antisocial behavior.

References

Berk, L. (2008). *Infants, children and adolescents* (6th ed.).Boston, MA: Pearson Education.

Cloninger, C., Svrakic, D.(1997). Integrative psychobiological approach to psychiatric assessment and treatment. *Psychiatry, 60,* 120-141.

Dadds, M., & Salmon, K. (2003). Punishment insensitivity and parenting: temperament and learning as interacting risks for antisocial behavior. *Clinical Child and Family Psychology Review, 6(2)*, 69-86.

Ehrensaft, M. (2005). Interpersonal relationships and sex differences in the development of conduct problems. *Clinical Child and Family Psychology Review, 8 (1),* 39-63.

Eisenberg, N., Cumberland, A., Spinrad, T., Fabes, R., Shepard, S., Reiser, M., et al. (2001). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development, 72,* 1112-1134.

Eisenberg, N., & Fabes, R. A. (1992). Emotion, regulation, and the development of social competence. *Review of personality and social psychology, 14,* 119-150.

Eisenberg, N., Guthrie, I., Fabes, R., Shepard, S., Losoya, S., Murphy, B., et al. (2000). Prediction of elementary school children's externalizing problem behaviors from attentional and behavioral regulation and negative emotionality. *Child Development, 71,* 1367-1382.

Feingold, A. (1994). Gender differences in personality: a meta-analysis. *Psychological Bulletin*, *116*, 429–456.

Frick, P., & Morris, A. (2004). Temperament and developmental pathways to conduct problems. *Journal of Clinical Child and Adolescent Psychology, 33 (1),* 54-68.

Giancola, P. (1995). Evidence for dorsolateral and orbital prefrontal cortical involvement in the expression of aggressive behavior. *Aggressive behavior, 21,* 431-450.

Giancola, P. (2000). Temperament and antisocial behavior in preadolescent boys with or without a family history of substance use disorder. *Psychology of Addictive Behaviors, 14 (1),* 56-68.

Giancola, P., Mezzich, A., & Tarter, R. (1998). Executive cognitive functioning, temperament, and antisocial behavior in conduct-disordered adolescent females. *Journal of Abnormal Psychology, 107 (4)*, 629-641.

Henry, B., Caspi, A., Moffitt, T., & Silva, P. (1996). Temperamental and familial predictors of violent and nonviolent criminal convictions: age 3 to age 18. *Developmental Psychology, 32*

(4), 614-623.

Kagan, J., & Snidman, N. (2004). *The long shadow of temperament.* Cambridge, MA: Harvard University Press.

Kemp, D., & Center, D. (2000). Troubled children grown-up: antisocial behavior in young adult criminals. *Education and treatment of children, 23 (3),* 223-238.

Kiel, V., & Price, M. (2006). Externalizing behaviors in child welfare settings: definition, prevalence, and implications for assessment and treatment. *Children and Youth Services Review, 28 (7),* 761-779.

Kochanska, G., Murray, K., & Harlan, E. (2000). Effortful control in early childhood: continuity and change, antecedents, and implications for social development. *Developmental Psychology, 36 (2),* 220-232.

Liu, J. (2004). Childhood externalizing behavior: theory and implications. *Journal of Child and Adolescent Psychiatric Nursing, 17 (3),* 93-103.

Martel, M., Pierce, L., Nigg, J., Jester, J., Adams, K., Puttler, L., ... & Zucker, A. (2009). Temperament pathways to childhood disruptive behavior and adolescence substance abuse: testing a cascade model. *Journal of Abnormal Child Psychology, 37,* 363-373.

Mash, E., & Wolfe, D. (2010). *Abnormal child psychology* (4th ed.). Belmont, CA: Wadsworth.

Moffitt, T., & Caspi, A. (2001). Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways among males and females. *Development and Psychopathology, 13,* 355-375.

Muris, P., Meesters, C., & Blijlevens, P. (2007). Self-reported reactive and regulative temperament in early adolescence: relations to internalizng and externalizing problem behavior and "Big Three" personality factors. *Journal of Adolescence, 30,* 1035-1049.

Oldehinkel, A., Hartman, C., de Winter, A., Veenstra, R., & Ormel, J. (2004). Temperament profiles

associated with internalizing and externalizing problems in preadolescence. *Development and Psychopathology, 16,* 421-440.

De Pauw, S., & Mervielde, I. (2010). Temperament, personality and developmental psychopathology: a review based on the conceptual dimensions underlying childhood traits. *Child Psychiatry and Human Development, 41,* 313-319.

Pinderhughes, E., Bates, J., Dodge, K., Pettit, G., & Zelli, A. (2000). Discipline responses: Influences of parents' socioeconomic status, ethnicity, beliefs about parenting, stress, and

cognitive-emotional processes. *Journal of Family Psychology*, *14*, 380–400.

Pitzer, M., Esser, G., Schmidt, M., & Laucht, M. (2010). Early predictors of antisocial developmental pathways among boys and girls. *Acta Psychiatrica Scandinavica, 121,* 52-64.

Rose, A., & Rudolph, K. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin*, *132*, 98–131.

Rothbart, M., Ahadi, S., & Evans, D. (2000). Temperament and personality: origins and outcomes. *Journal of Personality and Social Psychology, 78 (1)*, 122-135.

Rothbart, M., & Bates, J. (1998). Temperament. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional and personality development* (5th ed., pp. 105-176). New York: Wiley. Temperament-Part 1(pgs. 105-139) & Temperament-Part 2(pgs. 140-176).

Rothbart, M., & Putnam, S. (2002). Temperament and socialization. In L. Pulkkinen & A. Caspi (Eds.), *Paths to successful development (*pp. 19-45). Cambridge: Cambridge University Press.

Saltaris, C. (2002). Psychopathy in juvenile offenders: can temperament and attachment be considered as robust developmental precursors? *Clinical Psychology Review, 22*, 729-752

Schmeck, K., & Poustka, F. (2001). Temperament and disruptive behavior disorders. *Psychopathology, 34,* 159-163.

Shaw, D., & Winslow, E.(1997). Precursors and correlates of antisocial behavior from infancy to preschool. In D.M. Stoff, J. Breiling, & J. Maser (Eds.), *Handbook of antisocial behavior* (pp. 148-158). NewYork: Wiley.

Shaw, D., Winslow, E., Owens, E., Vondra, J., Cohn, J., & Bell, R. (1998). The development of early externalizing problems among children from low-income families: a transformational perspective. *Journal of Abnormal Child Psychology*, *26*, 95–107.

Veenstra, R., Lindenberg, S., Oldehinkel, A., de Winter, A., & Ormel, J. (2006). Temperament, environment, and antisocial behavior in a population sample of preadolescent boys and girls. *International Journal of Behavioral Development, 30 (5),* 422-432.