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Effects of Current Nature Versus Nurture Based Treatments on
Children and Adolescents Diagnosed With Conduct Disorder

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Abstract

A review of literature was conducted to evaluate effectiveness of nature versus nurture based therapies on children and adolescents diagnosed with conduct disorder. Physiological or nature based studies included research on the effects of 5-HT uptake in platelets, a 5-HT reuptake inhibitor called paroxetine, as well as the stimulants methylphenidate and clonidine. The 5-HT uptake study provided significant data correlating 5-HT uptake with reactive or retaliatory aggression. Environmental or nurture based studies included research on Parent Management Training, Cognitive-behavioral Therapy, and the Dina Dinosaur Treatment program. The Cognitive-behavioral therapy study identified a positive correlation between age and treatment effectiveness. The Dina Dinosaur Treatment displayed a correlation between a combination of Parent and Child Training and improvement in the home. Hans Eysenck's biosocial theory of personality is also examined as a tool in predicting whether physiological, behavioral, or combinations of both treatments are most effective in treating conduct disorder. This study showed significant results in a multi-systemic treatment approach towards conduct disorder. Results of the studies reflect a weakness in the amount of research being conducted to determine whether therapy combined with medication produces higher effects on conduct disorder than therapy or medication alone.

Key words: Conduct Disorder, Child Psychopathy, Treatments for CD, Adolescent Aggression, Conduct Disorder and ADHD.

Effects of Current Nature Versus Nurture Based Treatments on Children and Adolescents Diagnosed With Conduct Disorder

Mental health professionals utilize a variety of modern and outdated treatments for children and adolescents diagnosed with conduct disorder with varying and controversial results. The purpose of this review is to describe current methods of treatment, analyze results of various treatments, and discuss the implications of treatment on children and adolescents diagnosed with conduct disorder. Current literature from peer-reviewed journals on treatments for conduct disorder will be used to compile a broad sampling of treatments being utilized and studied on a national and international level.

Conduct disorder refers to children and adolescents who display a pattern of behaviors that violate societal rules including aggression, theft, lying, and vandalism among others (American Psychiatric Association [APA], 2000). This is not to be confused with 'acting out' or brief periods of behavioral problems. Conduct disorder is persistent, interferes with one's quality of life, and causes harm. Mental health professionals of all disciplines utilize a variety of treatments for children and adolescents diagnosed with conduct disorder. Many of these treatments have varying and controversial results. These differences may be caused by the fact that there are still many debated theories regarding possible causes of conduct disorder.

Most beliefs regarding conduct disorder treatments can be grouped into two major fields; those based on a biological nature theory and those based on a social nurture theory. The nature versus nurture argument has spanned generations of philosophers and scientists who have explored human behavior. In the "Diagnostic and statistical manual of mental disorders," or *DSM-IV-TR* (2000) text revision, conduct disorder is discussed as genetic and being predisposed to certain environmental factors like parental neglect, abuse, peer rejection, and exposure to

family mental health disorders among others (APA, 2000). This is a synthesis of the nature thesis versus the nurture antithesis. The purpose of this review is not to argue about the nature versus nurture theory but to describe current methods of treatment within these theories, analyze results of various treatments, and discuss the implications of treatment on children and adolescents diagnosed with conduct disorder.

Nature Based Treatments

Nature based treatments for conduct disorder revolve around the theory that conduct disorder is a physiological disorder. Research is aimed at identifying physiological differences of children and adolescents who have conduct disorder compared to their peers who do not. Treatments include medications to limit or ease the ‘side-effects’ of conduct disorder with hopes to ultimately ‘cure’ those who suffer from this disorder. A current study based on physiological differences in children with conduct disorder by Stadler, Schmeck, Nowraty, Müller, and Pouska, study the differences of 5-HT uptake in platelets between children diagnosed with conduct disorder compared to healthy children of the same ages (2004). Though this study does not examine a specific treatment, it does lend itself to further research of serotonin based psychopharmaceutical medications to treat conduct disorder with aggressive tendencies. Another study experimented with paroxetine, a 5-HT reuptake inhibitor, on twelve adult, prison inmates diagnosed with antisocial personality disorder with a history of conduct disorder (Cherek, Lane, Pietras, et al., 2002). Finally, a study was conducted on the effects of methylphenidate and clonidine in children with ADHD co-morbid with conduct disorder or aggressive oppositional defiant disorder (Connor, Barkley, Davis, 2000).

5-HT Transport Mechanisms and Treatment

Stadler, Schmeck, Nowraty, Muller, and Pouska conducted a study in Frankfurt, Germany on the differences of 5-HT uptake in platelets between adolescent boys ages nine to fourteen diagnosed with conduct disorder compared to healthy adolescents of the same ages (2004). The 5-HT is a nerve terminal that absorbs serotonin. Decreased 5-HT uptake has been observed in adolescents and adults with heightened aggressive behavior. This study emphasizes the difference between treatment of adolescents with aggressive versus non-aggressive conduct disorder. There are twenty-three symptoms of conduct disorder including aggressive and non-aggressive symptoms though only four are needed to be diagnosed with this disorder. Even when the child exhibits aggressive tendencies, extra distinction must be made to determine whether the aggression is considered reactive versus proactive. Reactive aggression is retaliatory in nature or a secondary response to some form of stimuli. It is similar to impulsive aggression and tends towards more effective results with serotonin treatments. Proactive aggression, also termed as instrumental aggression, is a more primary or elemental response to any stressful situation. Compared to reactive aggression, proactive aggression has a propensity for favorable outcomes in behavior. Thus, it is important to determine aggressive tendencies in children and adolescents with diagnosed with conduct disorder as this may help predict which type of treatment would be most effective.

Though this study was not aimed at treatment in and of itself, it does offer a wealth of significant data linking 5-HT uptake to conduct disorder with reactive aggressive tendencies (Stadler, et al., 2004). The data in this study will be of high importance to all current and future studies involving serotonin based psycho-pharmaceuticals and aggressive conduct disorder.

Another study dealing with 5-HT was conducted on twelve adult prison inmates who had a history of conduct disorder and were later diagnosed with antisocial personality disorder

(Cherek, Lane, Pietras, et al., 2002). These subjects were administered paroxetine, a 5-HT reuptake inhibitor, or a placebo, over four weeks and observed for aggressive and impulsive behaviors. When using ANOVA statistical analysis of variance on behaviors observed before and after the treatment, results showed that all main effects and interactions were not significant.

It is important to note that this study was conducted on only twelve adults who, though they may have had conduct disorder growing up, were diagnosed with antisocial personality disorder, which is commonly believed to be untreatable. Antisocial personality disorder (APD) is a diagnosis given to adults age eighteen or older who exhibit a pattern of behaviors that violate or disregard the rights of others (APA, 2000). The main difference between APD and conduct disorder is the age at diagnosis. Children or adolescents under the age of eighteen will not be given a diagnosis of APD until they turn eighteen and still exhibit disregard for others' rights. Conversely, a criterion for diagnosing APD is a history of conduct disorder in childhood and/or adolescents. The age criteria are based on the belief that conduct disorder is treatable in children and adolescents but if left untreated, it can develop into a pervasive and inflexible personality disorder which is resistant to treatments. Studies involving adults diagnosed with antisocial personality disorder are helpful in identifying trends of behavior in childhood and possibly identifying markers of when treatments would have been effective or markers to indicate whether treatments would have been effective at all. It is also easier to study adults and avoid many consensual and ethical problems involved in studies with children.

Though it is easier to study adults like the twelve prison inmates it is important to note that drug treatments can have a very different effect on children compared to adults (Cherek, Lane, Pietras, et al., 2002). Even though the paroxetine did not have significant results in these adults, the same can not be assumed when applied to children and adolescents who are still

developing and may have a higher chance of responding to treatment. This possibility exists because the developing brain reacts differently to chemicals than it would when fully developed. Just the introduction of certain treatments to children and adolescents can have a long-term effect on brain development either positively or negatively. It is possible that the introduction of 5-HT reuptake to the developing brain would have a positive effect on behaviors associated with conduct disorder. This is another aspect of 5-HT that needs further study.

Methylphenidate and Clonidine

Connor, Barkley, and Davis, conducted a study on the effects of methylphenidate and clonidine on twenty-four children who were diagnosed with attention deficit hyperactivity disorder (ADHD) and also diagnosed with either aggressive oppositional defiant disorder (ODD), or conduct disorder (2000). ODD is a pattern of hostile behaviors and attitudes towards figures in authority (APA, 2000). Disruptive behaviors exhibited in ODD are similar to disruptive behaviors in conduct disorder but of a less severe nature. Unlike conduct disorder, ODD usually does not include aggression towards people or animals, theft, or property destruction among others.

In the methylphenidate and clonidine study, the twenty-four children were randomly divided into three groups of eight participants and each group was administered methylphenidate, clonidine, or a combination of both drugs (Connor, Barkley, and Davis, 2000). The study was double blind and neither the children nor the witnesses providing evaluations and dependent measures knew which child belonged to which group. During the study the children were seen weekly by a psychiatrist to evaluate performance under the medications. The drugs were titrated over the first month and then all three groups continued at maximum dosage for the following two months. The researchers used a two-way repeated measures ANOVA analysis of

variance to study the results of their experiment. Results indicated a slight significance indicating that the treatments were effective over a three month period; however, due to the small number of subjects and lack of control group, these results are just indications that more research is needed on a larger scale to provide more concrete results. An important factor in this study that the researchers pointed out is that although there were significant differences found in some of the data collected, this study did not involve a placebo or control group so we can not determine the impact, if any, the placebo effect had on this study.

Nurture Based Treatments

While reviewing various peer-reviewed journal articles on treatments for conduct disorder, nurture based treatments for conduct disorder appeared with the most prevalence. These treatments involve modifying the parent's behaviors in order to control the child's behavior or using cognitive-behavioral therapies to change a child's thought processes and ultimately behaviors (Van de Weil, Matthys, Cohen-Kettenis, Van Engeland, et al., 2002). A European study at the Rudolph Magnus Institute for Neurosciences in Utrecht utilized Parent Management Training (PMT) and Cognitive-behavioral Therapy (CBT) in order to determine effectiveness of treatments (Van de Weil, et al., 2002). In addition to this study, Dr. Bruce Dykeman of Roosevelt University conducted a study to determine the effectiveness of CBT in adolescents age 14-16 (2000). The coercion theory is also mentioned to give a brief background on beliefs leading to parental training (Fisher, Kane, 1998). Finally, Dr. Carolyn Webster-Stratton and Dr. M. Jamilla Reid of University of Washington discusses a Dina Dinosaur Treatment Program that utilizes both parental programs and cognitive-behavioral techniques for children ages 4-8 (2003).

Parent Management Training (PMT)

Parent Management Training (PMT) involves the belief that social interactions between parent and child may play a role in the persistence of conduct disorder (Van de Weil, et al., 2002). This approach includes positive and negative reinforcement strategies like praise to promote desirable behaviors and time-out to discourage undesirable behaviors. Weaknesses of this approach involve parental involvement and severity of conduct disorder. Children whose parents have a history of antisocial behavior, marital problems, or socio-economic problems are less inclined to persist through a treatment program of any sort. Also, children who experience a more severe form of conduct disorder with characteristics like rape, assault, battery, and murder among others, tend to be unresponsive to treatment (APA, 2000). Van de Weil cautions against taking these results as positive above other approaches because they were conducted in research settings and may not reflect the outcomes of clinical practice (Van de Weil, et al., 2002).

Coercion Theory, Attachment and Affect Regulation

Another common belief that leads to the usage of parental training is based on the Coercion Theory, in which children develop conduct disorder because they learn from their parents or guardians at an early age that they must coerce others to get what they want or need (Fisher, Kane, 1998). This theory is sometimes erroneously used to blame the parents for the child's disorder. The theory is meant to explain the child's behavior as a socially learned behavior resulting from inconsistent or aversive reinforcement. Even though no current research has been found to support this argument and significant statistical data is lacking, this theory does give an explanation of some of the behaviors children with conduct disorder display and lends itself to further study.

Attachment and affect regulation theories take the coercion theory to another level by adding the effect of social attachment to explain conduct disorder (Keiley, 2002). This theory

involves the belief that children who are diagnosed with conduct disorder were unable to form attachments to parents or guardians at an early age and thus developed narcissistic behaviors leading to conduct disorder. No research was presented to support this theory but it is used widely as a basis for parental management training.

Cognitive-behavioral Therapy (CBT)

Cognitive-behavioral Therapy (CBT) focuses on abnormal cognitive processing of situations in children diagnosed with conduct disorder (Van de Weil, et al., 2002). This is based on the theory that children have certain steps or thought processes that they must go through before acting in response to certain social situations. For example, a well-adapted child will pick up on numerous social cues while in conversation with another child. A child with aggressive tendencies may only pick up on cues with hostile intent and bypass all the other social cues in the conversation. Based on these theories, CBT involves assisting the child to identify a variety of social cues, behave in content with these numerous cues, and develop anger management strategies.

Results of this study were not significant enough to show that CBT had an effect on children with conduct disorder though a trend was discovered regarding a positive relationship between the age of the child and effectiveness of treatment (Van de Weil, et al., 2002). This is an indication that CBT may have an effect with older children and adolescents rather than with younger children.

Dykeman's CBT study involved a small group, eight male students, of fourteen to sixteen year-olds diagnosed with conduct disorder and focused primarily on an eight week, twenty-four sessions, cognitive-behavioral therapy aimed at anger management (2000). Each member of the group was paired with another member who had similar anger problems yet one member of each

pair was older, more mature, and experienced less severe conduct disorder. Treatment consisted of role-playing and role-reversals to build empathy towards others. Three stages were set for the counselor's to assist the students. The first stage involved the counselor assisting each pair to develop a sense of power and control over the treatment process. The second stage involved cognitive techniques aimed at helping the students to identify problems, consider options, choose a socially acceptable strategy, and evaluate the outcomes. The last stage involved shared reflections and communication techniques. To determine the effectiveness of this treatment program, Dykeman utilized Spielberger's (1991) State Trait Anger Expression Inventory (STAXI) at the beginning and end of the eight week session (as cited in Dykeman, 2000). The STAXI scale is highly effective for this type of experiment because it measures a variety of anger components and provides validity and reliability scales for use with adolescent males. A Bonferroni correction to control error led to an alpha level of .0063 required to determine significance of results using the STAXI scales.

Results of this experiment were mixed showing that students who had anger management problems could benefit from this type of program (Dykeman, 2000). However, results also showed that this program was more effective at controlling situational anger rather than the underlying problems of conduct disorder. Thus, it may not be effective in the long-run for students with moderate to severe conduct disorder.

The Dina Dinosaur Treatment Program

Webster-Stratton and Reid studied the effects of a social, emotional, cognitive based treatment program on children age's four to eight who were diagnosed with conduct disorder (2003). A treatment program called, The Incredible Years Dinosaur Social, Emotional and Problem Solving Child Training Program, emphasizes teaching the child skills to identify

emotions, feel empathy, learn anger management, and communication techniques among others. Therapeutic techniques utilized include fantasy play, puppet modeling, and reinforcement among others. A group of 159 families who had children that were diagnosed with conduct disorder but had never received treatment, volunteered for the program and were divided into different experimental and control groups including the Parent Training (PT) group, the Child Training (CT) group, the Parent & Child Training (PT + CT) group, and a control group that received no therapy or training.

Results determined that the combined PT + CT group experienced the most effective results compared to the PT group alone and the PT, CT, PT + CT groups all maintained more effective results compared to the control group (Webster-Stratton, Reid, 2003). It is important to note that effectiveness was determined based on parental reports of the child's behaviors. Changes in the classroom were insignificant according to teacher reports of the child's behaviors regardless of the group the child had belonged to.

Nature and Nurture Synthesis Based Treatments

Though treatments based on theories that socio-economic environment and parental upbringings remain prevalent, more focus is being given to physiological differences in children diagnosed with conduct disorder compared to their 'healthy' peers. A compromise between the two views is also becoming more and more prevalent in research studies in order to determine most effective treatments. David Center and Dawn Kemp of Georgia State University have studied Hans Eysenck's biosocial theory of personality in order to predict how a child or adolescent with conduct disorder will fare in the different types of treatment (2003).

Personality Models

Center and Kemp hypothesize that conduct disorder develops due to genetically predisposed traits and environmental or social factors (2003). This hypothesis is studied utilizing Eysenck's three-factor model of personality including Extroversion (E), Neuroticism (N), and Psychoticism (P) (as cited in Center, Kemp, 2003).

Extroversion is based on a scale measuring sociability versus avoidance (Center, Kemp, 2003). This trait is hypothesized to be physiological with introverts having a higher basal level of cortical arousal than extroverts. Neuroticism is based on a scale measuring emotional instability on one end and emotional control on the other. This is hypothesized to be due to differences in visceral brain activation controlled by the hypothalamus and limbic system. Psychoticism is based on a scale measuring aggression on one end and empathy on the other. Psychoticism is hypothesized to be due to a large number of genes that lead to antisocial personality disorder, conduct disorder with aggressive tendencies, schizophrenia, and borderline personalities among others.

Using Eysenck's three-factor model of personality, along with behavior modification and cognitive-behavioral therapies, Center and Kemp found that those who scored a high P trait were least responsive to behavioral therapies (2003). Overall, a multi-systemic treatment (MST) approach appears to be the most affective with conduct disorder. This approach includes the family, school, and community in the treatment programs though they are more short-term, situation focused versus long-term behavioral changes.

Discussion

Studies mentioned in this review have provided much data to the scientific community in order to explain and treat conduct disorder in children and adolescents. Despite these treatments studied and any significant results mentioned, it is important to understand that though subjects

may reflect significance in a experimental or research setting, clinical practice does not involve any of the controls that can be placed on an experimental setting (Follette, Callaghan, 2001; Kazdin, 2001). When treatments are utilized in a clinical setting, control bias, and confounding variables may occur and treatments will ultimately work only on individual bases.

Another factor to note is that studies are being conducted that show differing opinions on current criteria for diagnosing conduct disorder as found in the DSM-IV (Tackett, Krueger, Sawyer, et al. 2003). A few studies have identified two groupings of conduct disorder behaviors, overt (aggressive) versus covert (non-aggressive). Some of these studies have indicated that efficacy of treatments are predicated upon whether the child or adolescent has overt (aggressive) conduct disorder or covert (non-aggressive) conduct disorder (Tackett, Krueger, Sawyer, et al. 2003; Scott, 1998; Stadler, Schmeck, Nowraty, et al. 2004). Studies have also found data to show that subjects with overt conduct disorder are not likely to respond to any treatments; whereas, subjects with covert conduct disorder are more likely to respond to treatment (Lahey, Loeber, Burke, et al. 2002).

New research shows significant differences between serotonin up-take in those with conduct disorder versus those without (Stadler, et al., 2004). Research also reflects that the most common treatments for conduct disorder involve parental training programs and cognitive-behavioral therapies (Van de Weil, et al., 2002). While research findings are important to determine effective treatments of conduct disorder, research conditions may influence the results as most subjects studied are volunteers who can lead to bias and error in the study (Van de Weil, et al., 2002). In conclusion, while much research has concentrated specifically on therapy alone or medication alone, or no treatment, further research is needed to determine whether therapy combined with medication produces higher effects on conduct disorder than the other individual

groups. This can also lead to further research regarding the combination of genetic predispositions with environmental influences.

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