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CONSCIENCE SENSITIVE PSYCHIATRIC DIAGNOSIS OF MALTREATED CHILDREN AND ADOLESCENTS

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TABLE OF CONTENTS	PAGE
Acknowledgements	4
Abstract	4
Introduction	5
Axes I and IV Expanded: Variables of Maltreatment	5-----10
Axis II Expanded	11-----34
Conscience: The Heart of the Personality	12---19
Conscience and Maltreatment	19---25
First Case Vignette	26---27
Second Case Vignette	28---29
Axis III Expanded: Developmental Psychobiology	35-----42
A Heritable Trait for Conscience Formation?	36---38
Neurotransmitter Research Findings	38---39
The Psychobiology of Maltreatment	39---41
Towards the Psychobiology of Conscience	41---42
Summary	42
Endnotes	43---46
References	47---54

Tables and Charts

<i>1. Axis I and Diagnoses Attributed to Or Associated with Maltreatment</i>	8---9
<i>2. Domains of Conscience</i>	13---15
<i>3. Correspondence Between Conscience Domains And Temperament and Character Factors</i>	19
<i>4. Psychopathologic Interference Configured According to Conscience Domains</i>	21
<i>5. Sequelae of Maltreatment Conceptualized According to the Domains of Conscience</i>	25

Conscience Drawings

Boy, 14 years old	10
Girl, 17 years old	11
Children, 12 years old, Exemplifying Domains	13---15
Boy, 11 years old, in Residential Program	15
Girl, 16 years old, in Residential Program	15
Boy, 16 years old, in Residential Program	15
Girl, 14 years old, Case Vignette	27
Boy, 13 years old, Case Vignette	28
Additional Conscience Images of Maltreated Youth	29---34
Boy, 14 years old	35

Abstract. The sequelae of maltreatment are conceptualized according to the DSM IV multiaxial system expanded for heuristic purposes. Axis I and Axis IV are expanded to take into account important variables of maltreatment. Differential Axis I diagnoses are identified with special emphasis placed on PTSD, Dissociation, Depression and Disruptive Behavior Disorders. Axes II and III are heuristically expanded to call attention to developmental psychopathology, particularly in the domains of conscience, and associated putative neurobiological sequelae of maltreatment, indicating a pathway to the psychobiology of conscience. Conscience sensitive assessment of maltreated children is illustrated with two case vignettes and selected conscience drawings. A ‘transaxial,’ conscience sensitive approach to DSM nosology is recommended as a corrective. There will likely be additional implications for the psychobiology of conscience as neuroimaging and assessment of conscience functions in health and psychopathology become more refined. **Conscience Works: Theory and Research.** 1: 1-54, 2001. ^φ

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Revised according to DSM IV, a new version entitled "The Sequelae of Maltreatment Conceptualized According to DSM IV" was included in Proceedings of **The 20th Arthur B. Richter Conference in Child and Adolescent Psychiatry, To Jail or not to Jail: Teen Offender As Criminal, Delinquent or Patient: Physiologic Basis of Delinquent and Antisocial Behavior in Juveniles**. Indianapolis, In., April 19, 1997. Following the Richter Conference, the need became apparent to the authors to integrate substantively new material drawn from our own and others' research on the developmental domains of conscience and the sequelae of maltreatment. The resulting revision and restructuring of the paper was presented in a poster presentation at the **International Society for the Prevention of Child Abuse and Neglect, Biannual Conference**, Auckland NZ, 9/6-9/98.

Use of the unpublished manuscript entitled "Maltreatment and perspectives on psychopathologic interference in conscience functioning in acutely disturbed adolescents" is by permission of Dr. Kelda Walsh, the first author. The report by Walsh et al., prepared in 1999, was based upon studies of maltreatment, which were conducted at I.U. 1991-93 with the assistance of Lin Ewing, RN, Mick Welling, M.D. Laura Harris *James E. Simmons Summer Intern*, Mr. Harry Brittain and Angela George, ACSW.

Dr. Stilwell's images and core concepts in Table 2 are extracted from her handout "Nurturing Five Domains of Conscience Functioning, A Pentagonal Therapeutic Task."

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INTRODUCTION

Sequelae of maltreatment can be conceptualized in terms of the multi-axial system of the Diagnostic and Statistical Manual (DSM). There are good reasons for doing so. First, developmental profiles have emerged with increasing specificity regarding the sequelae of various maltreatment experiences. Correlational studies have linked maltreatment to specific Axis I and Axis II diagnoses as well as associated biological findings which, depending upon eventual discoveries about their functional significance, may be candidates for Axis III. Second, the study of maltreatment is definitely a *trans*-disciplinary and, in its best form, an *interdisciplinary* enterprise. DSM is commonly accepted by medical, mental health, correctional and school professionals. Therefore, placing research findings regarding the sequelae of maltreatment within a multi-axial system provides common ground for professional understanding. Nonetheless DSM has been viewed by many in the aforementioned fields, including psychiatry, as inadequate to the task of providing a coherent nosology of conditions and disorders associated with maltreatment. Dissatisfaction may derive, for example, from a felt burden to use 'the medical model' in order to appease market or institutional pressures. Or it may derive from the problematic nature of categorical diagnoses applied to essentially dimensional phenomena, or it may derive from a larger concern with the dominant folk and academic psychiatry that makes it difficult to bring moral psychological description into the clinical picture. DSM is the classification we and those we serve are immersed in. Under the circumstances, it is important not to throw the baby out with the bath water. In the interest of providing as complete an account of this field of study as possible, in particular the possible consequences of maltreatment in the developmental domains of conscience, Axes I through IV are heuristically expanded as indicated in the text. In the last decade, the DSM made a transition from DSM III-R (APA, 1987) to DSM IV (APA, 1994). DSM IV will be utilized to conceptualize consequences of maltreatment; however, research studies cited were often based on DSM III-R.

AXES I AND IV EXPANDED: VARIABLES OF MALTREATMENT

In DSM III-R, **Axis IV** was used to encode psychosocial stressors as acute or enduring circumstances. In DSM IV, **Problems Related to Abuse or Neglect** are actually encoded on Axis I as **995 codes** (when the focus of attention is on the victim), whereas Axis IV is reserved for **psychosocial and environmental problems**, no longer separated into acute and enduring circumstances and no longer rated for severity.

However, the developmental implications of maltreatment are best appreciated if the clinician has also extracted from the history of present illness, the family history or the developmental history an account of the experience in terms of pertinent **variables of maltreatment: age at onset, duration, frequency, and kind, relationship to perpetrator, severity** as well as closely related **protective and aggravating factors**. One way a clinician might facilitate completion of this task is to devote a section of the psychiatric evaluation to "Adverse Life Experiences" in which the child is asked to chronicle bad things that have happened to her, and then to characterize them to the extent she is comfortable. Clinicians who are MD's who may be engaged primarily in pharmacotherapy of medicable target symptoms and who do not wish to make the child re-tell all the details of her experience, may preface this conversation with a statement of openness coupled with a statement of respect for the child's autonomy in regulating her self-disclosure and an explanation of what is most important for the physician to know, along the lines of the model:

"I want to listen to all that you have to tell me about your bad experience. I understand that, for now anyway, there are some things you may wish to keep to yourself or just between you and your therapist. Things very important for me to know as your doctor don't require you to tell the whole story of what happened. But I do think it's important for me to know ____ (specify the maltreatment variable of concern)."

Many children who don't want to talk about their experience in detail, for fear of re-entry, may be able to identify age at onset, duration, kind, relationship to perpetrator and often will even respond to the question, "How has this experience affected (or changed) you?" -- perhaps for the first time

making explicit the attributions she makes or has made to the maltreatment experience. For examples of results from this approach, see the case vignettes p.35 ff.

Leaving in abeyance the technical difficulties with ascertainment of ‘what’ and ‘when’ and ‘how long’, the timing of maltreatment is still viewed by workers in the field as crucial in its implications for sequential development (Perry and Pollard, 1998). **Age at onset** may seem, on the face of things at least, the maltreatment variable easiest to characterize and the most objective. An example of work on this variable is an unpublished study conducted by investigators at Indiana University School of Medicine (Walsh, Kronenberger, Hu, Stilwell, and Galvin, unpublished manuscript; see below the section entitled “Conscience and Maltreatment”).¹ However the maltreatment variable **duration** (and, presumably, **frequency**) combines with other variables to confound interpretation. Unremitting exposure to maltreatment conditions MAY be one among other variables of more significance than age at onset during a putatively sensitive period of development. Age at onset of maltreatment, as will be discussed in more detail further on, may also be associated with neurobiologic markers to which, hypothetically, are attributed psychobiological functional correlates.

If age at onset is roughly susceptible to characterization for some kinds of maltreatment, it is quite otherwise for other **kinds** of maltreatment (e.g. psychological or emotional neglect and abuse). Reportable maltreatment episodes lie at the extreme of this continuum which, in relatively subacute form, may yet dominate the child's day to day reality over time, producing effects at least as pernicious as the reportable episodes themselves. More enduring circumstances associated with maltreatment include fears of retaliation from the alleged perpetrator or of rejection from disbelieving family members for disclosure of the maltreatment. On the other hand, the severity of the maltreatment may be moderated or attenuated by positive aspects of **the victim's relationship to the perpetrator**. Moreover there is apt to be a cascade of stressors associated with familial disruption once protective services are activated on behalf of the victim. Axis IV is serviceable for encoding stressors associated with "the continuum of caretaker casualty" (Sameroff and Chandler, 1975) such as rejection, harsh and inconsistent parenting or exposure to domestic violence and for the stressful sequelae of either ‘keeping the secret’ or disclosing it.

Taking “a transactional-ecological approach” (Cicchetti & Rogosch, 1994), **aggravating or potentiating** factors can be conceptualized as familial, communal or societal. Potentiating family features include chronic poverty, domestic violence, unstable marital relationships, parental substance abuse and psychopathology, poor education, unemployment and parental history of maltreatment. Within the community, potentiators include high levels of violence and crime, poor schools and impoverished community resources while in the culture, potentiators include acceptance of violence and failure to sufficiently value the rights of children. These interact with other non-maltreatment variables including the influence of older and younger siblings, emotional identifications with family, class, and ethnic group (Kagan, 1998).² **Relieving or protective** factors may be found in the converse of potentiating factors. The potentiating factors in and of themselves are likely to have neurobiological sequelae mediated by interactive stress responsive systems still poorly understood in the developing child or adolescent. In fact potentiators and/or consequences of maltreatment may be identified in any of the problem areas encoded on Axis IV: primary support group, social environment, educational, occupational, housing, access to health care services and interaction with the legal system. Frequent exposure to urban violence and trauma constitutes another related enduring circumstance perhaps with similar sequelae.

Severity is first of all influenced by an evolving *sense of violation* regarding the experience sustained (perhaps in repressed form) in long-term memory. *Sense of violation* is, like other terms appearing in these pages (for example: *abuse, neglect, maltreatment, victim* and even *endure*), ‘valuationally thick’ (more value laden than other terms), and apt to elicit moral reaction. Clinicians who strive to reduce their reliance upon valuationally thick terms because of concerns that these terms introduce bias into the assessment can nonetheless inquire about *the moral meaning* which the victim constructs from the experience. Of course, making any inquiry at all (that is, being at all curious about) a person's maltreatment experiences already upholds a healing value in one's interview technique: namely a conviction that acquiring personal information of this sort is important for understanding and treatment. The healing value (beneficence) justifies probing that is apt to inflict some pain. Conversely, to deliberately not inquire is an interview behavior possibly governed by a different valuation (dominated by, or

rationalized according to, the healing value, non-malificence –“do no harm”) rather than some touted ‘value-neutrality’.

Dr. Nancy Roeske, author, educator and child psychiatrist at Indiana University was fond of saying in supervision, “Every patient who comes to you has questions that may remain unspoken: first, ‘How ill am I?’ second, ‘Can anything be done about my illness?’ third, ‘Are you able to do what needs to be done?’ and fourth, “Why do you care?’ Add to these questions another about attribution: ‘Am I to blame?’ Add still other questions about perspective and negotiated meaning: in the first case vignette, the child asks in the course of the interview, “Do you consider it abuse if you are hit by something besides a hand and it leaves bruises?” is perhaps looking for consensual validation of her sense of violation that will pose an answer to the question ‘How severely was I mistreated?’ Moral meaning making or the construction of a moral worldview is directly related to conceptualization of conscience, which will be treated further on. Eisikovits (1998) proposes a constructivist theoretical model to conceptualize children’s experiences of interpersonal violence perpetrated by their fathers against their mothers. Four constructs used by children to come to terms with the experience are: living with a secret, living in conflict of loyalties, living in terror and fear, and living in an aggressive and dominance oriented context. As these meanings are derived from the experience of interpersonal violence they are said to be moralized. In **Lost Boys**, Garbarino (1998) poignantly highlights ten facts of life for violent boys. Five are explicitly attributed to trauma and each of these points to moralized meaning beyond the fact of life: child maltreatment leads to survival strategies that are often antisocial and/or self-destructive; the experience of early trauma leads boys to become hypersensitive to arousal in the face of threat and to respond to such threats by disconnecting emotionally or acting out aggressively; traumatized youth are likely to evidence an absence of future orientation; youth exposed to violence at home and in the community are likely to develop juvenile vigilantism, in which they do not trust an adult’s capacity and motivation to ensure safety and as a result believe they must take matters into their own hands; and traumatized youth who have experienced abandonment are likely to feel life is meaningless.³

Moral meaning making is seldom a solitary activity. The presence (or the lack), the emergence (or the loss) of someone perceived by the victim as caring and concerned are paramount among relational **protective** and **aggravating** factors. Caring and concern may take the form of moral reactivity to maltreatment itself and mobilize advocacy and prevention. Caring and concern may also be directed to the right and wrongdoing- the moral well being- of the victim. In response to this kind of care and concern, the victim may succeed in locating the ‘Archimedean Point’ from which he can dislodge the old valuational framework and espy the makings of a new one. Such protective factors are, of course, readily discernible in the therapeutic as well as the adaptive context. The therapist, guided by the healing values of her profession, participates explicitly or tacitly in the deconstruction and reconstruction of moral meaning. For example, the therapist has a sense of violation shaped not only by her empathy but also by her general theory of mind, her specific ideas about developmentally critical or sensitive periods and by expectations regarding how the maltreatment experience is to be ‘re-framed’ (i.e. ‘valued differently’) in order for healing to occur. Cultivating an awareness of conscience centered professional ethics, conscience sensitive interview techniques and a conscience sensitive approach to diagnosis make the healing values and the process of moral meaning making which those values guide, more transparent, more susceptible of communication to others and more apt to provide the foundation for conscience sensitive treatment planning.

Apart from its use for 995 codes, Axis I in DSM-IV retains the distinction of being the axis for major psychiatric disorders. On Axis I, one readily anticipates finding emotional, cognitive and behavioral sequelae of maltreatment-- provided the symptomatology is sufficiently extensive and severe as to warrant a categorical psychiatric diagnosis. Less obvious are symptoms reflecting valuational and volitional sequelae. In both folk and academic psychology, values and volitions have been encrypted in the broad categories of *cognition* and *affect* and surface only in fragmentary form among the diagnostic criteria. Some are more readily discernible from the standpoint of a heuristically expanded Axis II (see below). Table 1 represents recent studies that have associated Axis I diagnoses with some of the variables of maltreatment, explicitly **character** (i.e. sexual abuse, physical abuse and/or neglect), and implicitly, **severity** which, of all variables, is most difficult to assess. The Axis I diagnoses identified in Table I are discussed elsewhere in more detail (Ammerman & Galvin, 1998).

Table 1.

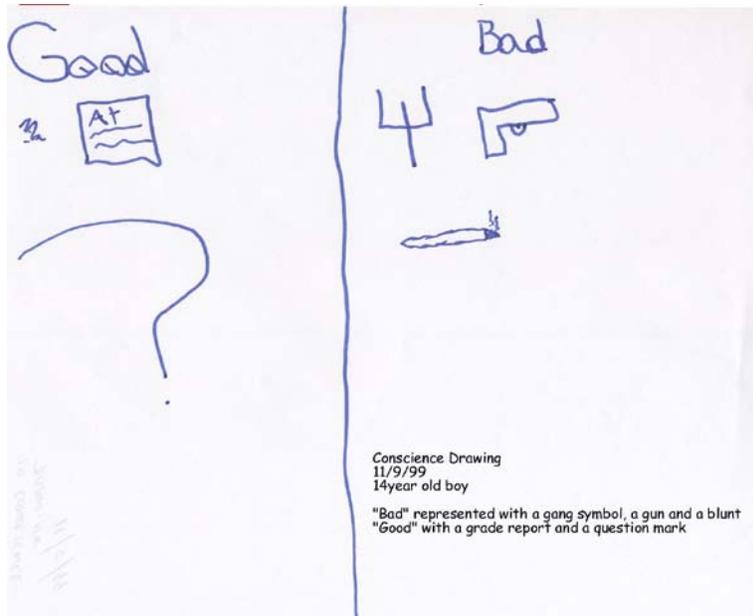
**AXIS I DIAGNOSES ATTRIBUTED TO
OR ASSOCIATED WITH MALTREATMENT**

AXIS I DX	Comments on Maltreatment Variables	Reference
Acute Post-Traumatic Stress Disorder (PTSD)	Recent and relatively circumscribed. (Compare Type I Trauma in Terr's typology)	Terr, 1991
	Less often apparent on parents' version of DICA than on child's version among inpatients studied.	Famularo et al., 1992
	Sexual Abuse (SA) > Physical Abuse (PA)	Pelcovitz et al., 1994
Dissociative Disorder Not Otherwise Specified		Coons, 1996 Lewis & Yeager, 1994 Lewis, 1996
Dissociative Identity Disorder (Multiple Personality Disorder)	SA plus PA	Beitchman et al., 1992
Affective Disorders	More apparent on parents' version DICA than on child's version among inpatients studied	Famularo, et al., 1992
Attention Deficit Hyperactive Disorder (ADHD)	Commonly diagnosed in both SA and PA victims	McCleer et al., 1994
Learning Disorders	Intrinsic vulnerability and/or sequelae predispose to caregiver frustration.	Lewis et al., 1988
Communication Disorders	Largely unexplored.	Allen & Oliver, 1982
Oppositional Defiant Disorder (ODD)		Famularo, et al., 1992
Conduct Disorders		Rogeness et al., 1986
	Aggressiveness more often associated with PA. Runaway behavior more often with SA.	Famularo et al., 1992

	More apparent on parents' version DICA than on child's version	Famularo et al., 1992
Substance Abuse	Bi-directional causality: in some, may increase risk of SA, in others may be sequelae of maltreatment	Hussey, 1996
Eating Disorders	Some evidence that women with bulimia without anorectic history have higher rate of childhood SA or PA	Douzinis et al., 1994
Psychosexual Disorder		Beitchman, et al., 1992
	SA: more negative descriptions of human relationships and more preoccupations with sexuality	Famularo, et al., 1992

Our own clinical experience mostly conforms to expectations based upon the aforementioned studies, however the last word has not been written on the association of PTSD with age at onset of maltreatment and, more particularly, when sexual abuse is contradistinguished from physical abuse. In a pilot study of 25 females between the ages of 13 and 17 (mean age 15y9m), maltreatment experiences were ascertained and characterized utilizing an abuse/neglect screen adapted from Rogeness, Macedo, Harris, and Fisher (1986). Eighteen (72%) had been maltreated. In seventy-six percent of the subjects the maltreatment included sexual abuse at some time. Subjects were grouped according to age at onset of their earliest maltreatment experiences (early=before 72m; late=after 72m) and compared to a non-maltreated group of psychiatrically hospitalized females. DSM III-R diagnoses were made by consensus at interdisciplinary diagnostic conferences and included consideration of results from routinely conducted structured diagnostic interviews (e.g. DICA). The most common Axis I diagnoses among maltreated subjects were PTSD and Major Depression. There were 13 diagnoses of PTSD in the early maltreated group (93%), 2 in the late group (29%) and no PTSD in the non-maltreated group (Adinamis, unpublished data from a study of consecutive admissions to an intermediate-stay adolescent inpatient psychiatric service).

PTSD is, in any event, an obvious consideration particularly if the maltreatment experience is recent and relatively circumscribed. However in more enduring adverse circumstances, as is the case for emotional unavailability, neglect, rejection, hostility and intermittent violence fostering hypervigilance, stress responses may be transduced into chronic anxiety and depression without associated PTSD symptoms. A theoretical model describing the biological transduction of stress into depression has been articulated by Post (1992). An area for further research is to what extent early maltreatment experiences predispose towards PTSD following subsequent maltreatment experiences by processes similar to 'kindling.' Garbarino (1999) has developed this point most recently in **Lost Boys**.



Conduct Disorder Solitary Aggressive Type (CDSA), a DSM III-R diagnosis which corresponds roughly to **Conduct Disorder, Childhood Onset** in DSM IV, is an important sequela of maltreatment occurring most frequently in boys (Rogeness et al., 1986). The possibility of transduction of the stresses associated with maltreatment into CDSA will be discussed in the section on Axis III. In a study (Galvin, Ten Eyck, Shekhar, Stilwell, Fineberg, Laite and Karwisch, 1995) of 50 psychiatrically hospitalized boys, ages 8.7-18.3y, mean age 12.5y, fourteen (28%) were diagnosed with CDSA, 13 (26%) had other types of conduct disorder and 14 (28%) had Oppositional Defiant Disorder. Since these are mutually exclusive diagnostic categories 82% of the subjects had a disruptive behavior disorder other than ADHD (which can overlap with many diagnoses and which 17 of the boys were diagnosed as having). In contrast, PTSD and Major Depression were each diagnosed in only 8 (16%) of the boys although 36 (72%) had been maltreated. Eleven (37%) who were maltreated early in life (before 72m) had CDSA vs. none who were maltreated later in life and 3 (21%) who were not maltreated. However, an association of age at onset of maltreatment and CDSA, while anticipated, was not confirmed statistically.

Reactive Attachment Disorder (RAD), considered uncommon in prevalence does not appear in Table 1, but has maltreatment (either parental or societal) embedded in the diagnostic criteria "C" which requires evidence of pathogenic care in one of three forms. These are: C-1 persistent disregard of the child's basic emotional needs for comfort, stimulation and affection, C-2 persistent disregard for the child's basic physical needs or C-3 repeated changes of primary caregiver that prevent formation of stable attachments (APA, 1994). How often pathogenic care results in RAD is a question of considerable interest pertaining to vulnerability and apparent resilience (or, from a different perspective, undetected harm) as well as reversibility of maltreatment effects (Perry & Pollard, 1998; Kagan, 1998).

AXIS II EXPANDED



Axis II is where mental retardation and personality disorders or traits are encoded. Axis II sequelae of maltreatment include adverse effects on intellectual functioning. Maltreatment is also implicated in the pathogenesis of *Borderline Personality Disorder* (Famularo et al, 1992) and other personality disorders as well (Johnson, Cohen, Brown, Smailes, and Bernstein, 1999). A few unscientific observations (per author MG, based upon frequent engagement in reviews of aggregated referral information to a residential treatment center) of how Axis II is used today are: often it is not used at all or its use is deferred indefinitely. Many clinicians are conservative in the approach to diagnosis of a personality disorder in children- and rightfully so. Some clinicians will record traits but refrain from encoding disorder. When clinicians do record traits they are enjoined by DSM to record only maladaptive ones. However when it comes to constructing a treatment plan, not only maladaptive traits but also adaptive ones, the relative strengths and competencies (even if subject to developmental delay) are extremely important to draw into the account. An expansion of the scope of Axis II for heuristic purposes permits an appreciation of other sequelae of maltreatment identified in research in both development and developmental psychopathology.

Development is the story of an individual's progress in moving from less to more psychological integration and differentiation, utilizing the biologically based systems that govern **cognitive functions, attachment, emotion, and learned behavior**. Coordination of these systems in interaction with the environment allows a person to construct increasingly complex psychological **meanings** in living.

Cognitive functions. Construction of meaning requires that *perceptions* be tolerated, absorbed and organized. Integration of perceptions involves the ability to attend without extremes in affective arousal, to be optimally stimulated between a lower orienting threshold and an upper aversion threshold. When orienting, an infant turns toward a novel stimulus and suppresses bodily movement. Physiologically, orienting is accompanied by pupil dilation, brain wave desynchronization, increased galvanic skin response, suppression of respiratory frequency, decreased peripheral blood flow, and an initial slowing of the heart rate (Dawson, 1991; NOVA, 1985). These physiologic responses habituate with repeated exposure. At the upper threshold, overly intense stimuli elicit the aversive response characterized by heart rate acceleration and failure to habituate on repeated exposure. To the extent these thresholds are biologically determined, individuals may have an arousal/aversion range that typifies their ability to tolerate novel events throughout the lifespan. Meaning is contingent on memory systems that

undergird internal representational models. Malignant episodic memories are psychobiologically linked affective, cognitive and arousal functions in stable toxic configurations; they are central to the definition of PTSD (Terr, 1988; Perry and Pollard, 1998).

Bowlby conceptualized **attachment** as a biological system with the proximal aim of providing a secure base from which the young may safely explore the world and a distal aim of preserving the species. Deficiencies and deviancies in caregiver attachment abilities have been causally linked to insecurity, social avoidance, social resistance and emotional/cognitive disorganization, as well as behavior outside the realm of societal acceptability (Magid and McKelvey, 1987).

Construction of meaning requires that **emotion** be recognized, given context and modulated. Izard (1977) recognized ten discrete emotions that serve as primary motivators in human development: interest, joy, surprise, distress, anger, disgust, contempt, fear, shame, and guilt (also see Nathanson, 1991 and Zahn-Waxler and Kochanska, 1989). Deficiencies and deviancies in emotional homeostasis are related not only to affective disorders but also to social relatedness. In the moral development of the child, deficiencies and deviancies may mean a moral emotional setpoint fails to acquire a "be good/feel good" setting. **Learned behavior**, requiring more exposition in the context of conscience, will be taken up in the next section. Cicchetti and Toth (1995) have reviewed the literature on sequelae of maltreatment in the developmental domains of language (particularly inner state language), cognition, emotion, and self-other differentiation.

CONSCIENCE: THE HEART OF THE PERSONALITY

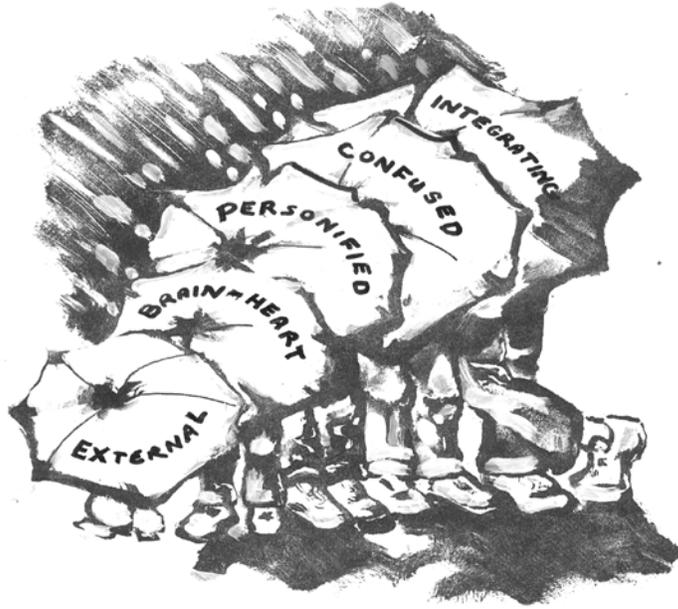
The impression one has from available research is that maltreatment at an early age has the potential for altering the child's developmental trajectory both immediately and in ways that do not become apparent until stage salient developmental milestones are neared. Nowhere is this more apparent than in social cognitive, social emotional, valuational and volitional development which depends upon the interplay of temperament, secure attachment and autonomy. The domains of moral- that is to say, conscience- development as verified or suggested by our studies of children and adolescents (whose ages spanned 5 to 17yrs old) using the Stilwell (semistructured) Conscience Interview (SCI) are **Conceptualization** (Stilwell & Galvin, 1985, Stilwell, Galvin, Kopta, 1991) **Moral Emotional Responsiveness** (Stilwell, Galvin, Kopta, and Norton, 1994) **Moral Attachment** (Stilwell, Galvin, Kopta, Padgett and Holt, 1997), **Valuation** (Stilwell, Galvin, Kopta and Padgett, 1996) and **Moral Autonomy** (Stilwell, Galvin, Kopta and Padgett, 1998).^ξ See Table 2.

^ξ There are recent renderings of these studies in traditional book form for the general adult lay public (Stilwell, Galvin and Kopta, 2000) and freely available in electronically published book form for the middle school aged and older child at <http://www.medlib.iupui.edu/conscience/> Galvin and Stilwell, Ferraro, Gaffney, 1998). The interested reader is also encouraged to read **Achieving Moral Health** (Shelton, 2000) which offers sustained and academically informed reflections in combination with practical advice based upon a seven dimensional view of conscience. There are substantial overlaps of Shelton's seven dimensions, which are derived from his general and clinical observations as well as his comprehensive view of the field of moral psychology, with the domains of conscience interpreted from semistructured interviews of children and adolescents.

Table 2.

DOMAINS OF CONSCIENCE

Conceptualization of conscience (Stilwell, et al., 1991) measures the degree of inclusiveness and abstractness a person utilizes when providing a personal definition of conscience. Five transformations in conceptualization of conscience occur between the ages of 5 and 17. The most salient feature of each has been incorporated into the names of the stages: External Conscience (age 6 and under), Brain or Heart Conscience (ages 7- 11), Heart/Mind or Personified Conscience (ages 12-13), Confused Conscience (ages 14- 15), and Integrated Conscience (ages 16- 17). Stage transitions in the other domains are anchored in the domain of conceptualization of conscience.



Helpful Image: Think of five umbrellas of increasing size. Think of four panels visible to the viewer. Each panel represents a domain. The handle, stem, and supporting framework represent the conceptualization domain...the part that ties it all together. Illustration by Sandy Ferraro, courtesy I.U. Conscience Project

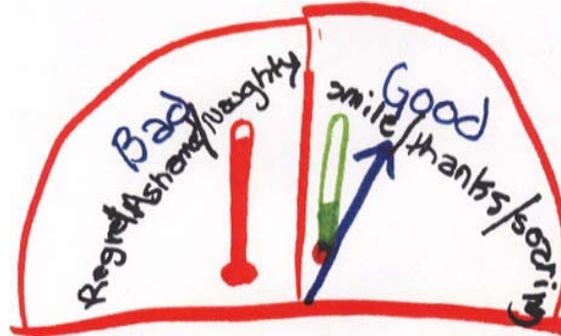
Moralization of attachment (Stilwell, et al, 1997) measures developmental transitions in the youngster's response to parental prohibitions and demands based upon how s/he links feelings of security, empathy and oughtness to child- parent and other child-authority figure relationships.



Core concept: The Attachment-Empathy-Oughtness Link. In early childhood, a person develops a sense of oughtness out of his/her need for physical and psychological security. As the child learns emotional cues as well as identifying those emotions in the self, s/he gradually learns that compliance/noncompliance with parental prohibitions and demands is followed by parent pleasure/displeasure. Mutual pleasure is the desirable state because it satisfies the bedrock value of connectedness. The link is formed.

Table 2 (cont')

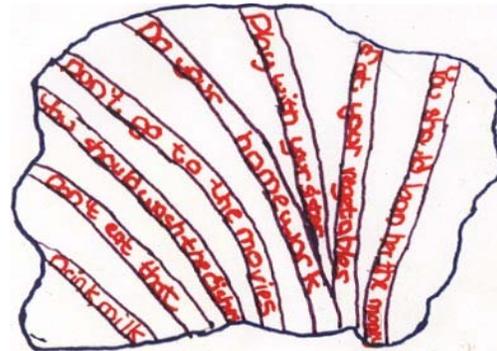
Moral-emotional responsiveness (Stilwell et al., 1994) measures developmental transitions in the way a child uses 1) anxiety and mood to regulate moral behavior and 2) processes of reparation and healing after wrongdoing to regain the physiological state normally experienced when feeling like a good person.



Core concept: Moral emotional responsiveness is the barometer of the conscience. The barometer is established when the early oughtness experiences are linked to regulation of emotions and their physiological manifestations, Awareness of an 'am good--do good--feel good' state becomes the set point of moral emotional harmony on the barometer.

Moral valuation (Stilwell, et al., 1996) measures developmental changes in the way a child justifies compliance or non-compliance with rules of conscience based on both reasoning and psychological defenses. This domain has three subdomains based on how the child categorizes rules of conscience as authority- derived, self- derived and peer-derived.

Imagery: Picture an infant lying helpless on the ground. S/he has to have *connectedness* with someone who will pick him/her up and care for him/her. S/he requires vocal and facial mirroring and soothing in order to express and regulate (*harmonize*) the storehouse of emotions s/he comes equipped with. S/he has to have a safe environment in which to explore and play (exercise *autonomy*) in order to make meaningful engagement with the world. Later, s/he has to have someone to communicate with to share what sense s/he is making of experiences (*reflectiveness*).



Core concept: Basic psychological needs constitute bedrock values (*italicized above*). The child learns that she ought to behave in certain ways for these bedrock values to be met. As the brain matures, learned oughtness/behaviors become rules which in time, generalize to abstract values (e.g. trust, loyalty, justice, caring, tolerance).

Table 2 (cont')

Moral volition (Stilwell et al, 1998) measures developmental transitions in how a child uses his/her sense of autonomy in responding to and redefining rules of conscience.



Core Concept: Autonomy and will allow a child to value being and doing as an individual. Autonomy and will become moralized as moral volition. The child gradually learns to make increasingly sophisticated judgement -derived choices about what s/he believes to be right or good. S/he combines what s/he has learned from others with his/her own moral intuitions, reasoning, defenses and risk-taking. Hard choices and courage are closely coordinated.

Additional Conscience Drawings from Adolescents in Out-of-Home Placements.



Conscience Drawing
11 y old boy



Conscience Drawing
16 y old girl



Conscience Drawing
16 y old boy
"My conscience looks like me It tells me what will happen if I do something."

Our findings based upon semistructured interviewing of older children and adolescents are consonant with those of Kochanska, Padavich and Koenig (1996; also see Kochanska, 1991 and 1993) who have established a meaningful correspondence between younger children's narrative interpretations of hypothetical moral dilemmas and objective measures of their conscience functions. The "declarative knowledge" expressed in narrative form was associated with both past and contemporaneous "procedural" action tendencies and with maternal reports. Children's consciences were measured objectively at time 1 (ages 26 to 41 months), again at time 2 (43-56 months), and by narrative at time 2. Although the age ranges were relatively restricted, there was evidence of cross-sectional developmental trends, as well as strong differences between time 1 and time 2, congruent with most theories depicting moral development as a gradual shift to more internalized regulation, growing empathy, and awareness of wrong-doing. Older preschoolers expressed more themes of empathy and guilt, more themes of confession/reparation, and fewer antisocial themes. Kochanska concludes that two developmental processes are important in conscience formation: the development of the tendency to experience affective discomfort, guilt and anxiety associated with wrong-doing and the development of behavioral control, the ability to inhibit a prohibited action (Kochanska, 1993). More recent contributions by Kochanska et al. to the study of conscience with respect to temperamental individual differences in *effortful control* have been among the subjects of a review of developing mechanisms of self-regulation (Posner and Rothbart, 2000). Self-regulation involves complex questions about the nature of volition (effortful control) and its relation to our genetic endowment and to social experience. Within cognitive psychology, the mechanisms thought to be involved in self-control are collectively called *attention*. Attention allows rapid changes in neural activity in local brain areas. Priority is produced, in the timeframe of milliseconds, by amplifying the amount of neural activity within the area performing the skill. When this is done voluntarily it is called *effortful attention*. Priming, in the timeframe of seconds or minutes, involves efficiently tuning the process in which automatic pathways are established, over minutes to days, by practice. Learning further involves the establishment of new connections stimulated by new associations over weeks, which eventuate, over additional weeks, in rule learning mediated by new structures, and, over years, development dependent upon more complex networks. Executive control is a second form of attention that emerges in the second year of life and is thought to involve the frontal midline (Posner & Rothbart, 2000). A psychobiological theoretical model of executive functions including response inhibition, nonverbal working memory, verbal working memory, self regulation of emotion and motivation, and reconstitution (e.g. processes of analysis and synthesis in self directed play) and the loci in the prefrontal regions that are implicated has been advanced (Barkley, 2000).

There is also at least partial convergence of the psychobiological interpretations drawn from the conscience study conducted by Stilwell et al. and ideas presented by Kagan (1998):

The human capacity for a moral motive and its associated emotions took from our primate ancestry a keen sensitivity to the voice, face, and actions of others but added five unique abilities:

- (1) to infer the thoughts and feelings of others,
- (2) to be self-aware
- (3) to apply the categories of good and bad to events and to self,
- (4) to reflect on past actions, and
- (5) to know that a particular act could have been suppressed.

The combination of these five talents created a novel system that first emerges in children in the second year and matures during the decade that follows... (p.169).

Allowing for overlaps, there is remarkable correspondence among these five unique abilities characterized in the preceding excerpt on the one hand and, on the other hand, the domains of conscience drawn from children's and adolescents own accounts and images in response to the SCI:

- (1) to moralization of emotion
- (2) to conceptualization of conscience,
- (3) to moral valuation,
- (4) to conceptualization of conscience and moral valuation and
- (5) to moral volition.

What does not appear among the “unique abilities” but is included, as essential among conscience domains is moralization of attachment.

As a first approximation, it may be said of conscience that it is a species and a refinement of consciousness.^NConscience is moral (-ized) consciousness. Hence what is generally discovered about the (neuro-) psychobiology of consciousness will be applicable to conscience as well. The model proposed by Damasio regarding the neural requirements for kinds of consciousness has at its foundation the non-conscious *proto-self*, a collection of interconnected and coherent but transient neural patterns representative of multiple dimensions of the organism’s current state (1999, pp. 154 and 174) . The proto-self as it is described appears to be more ‘neuro’ than ‘psycho’ -biological; it is necessary but not sufficient for ‘the first person’ of psychological descriptions to emerge; in addition it is inaccessible to the kinds of consciousness it supports. With the emergence of “core-consciousness” the threshold is crossed. Core consciousness occurs when the brain represents how the organism’s own state is affected by the organism’s processing of an object and when this process enhances the image of the causative object, placing it in a spatial and temporal context. This requires second order neural patterns (1999, pp. 169 and 179 ff). Sense of self and enhancement of the object arise out of cross regional integrations of neural activity at certain midline and phylogenetically older sites in the brain which are also involved in body regulation or representation and sites involved in the construction of the object (1999, p.270). “Extended consciousness” requires autobiographical self based on permanent but dispositional records which can be activated as neural patterns and turned into images (1999, pp. 174, 175, and 195 ff). Enter the possibility of conscience, which Damasio conceives as follows:

....Among [the] remarkable collection of abilities allowed by extended consciousness, two in particular deserve to be highlighted: first, the ability to rise above the dictates of advantage and disadvantage imposed by survival-related dispositions and, second, the critical detection of discords that leads to a search for truth and a desire to build norms and ideals for behavior and for the analyses of facts. These two abilities are not only my best candidates for the pinnacle of human distinctiveness, but they are also those which permit the truly human function that is so perfectly captured by the single word *conscience*.... (1999, p.230)

^N The terms “conscience” and “consciousness” are not infrequently confounded or treated as equivalents by respondents to the SCI. Initially this apparent confound was attributed to varying degrees, among children and adolescents, in their capacity for abstraction (along Piagetian cognitive developmental lines).In the context of the semi-structured interview, however, the respondent can be made aware that the interviewer is concerned to engage in dialogue about the part or parts of the person or personal processes that help him/her figure out right and wrong or good and bad, thereby avoiding misunderstanding. For the very young, even simpler language has been employed. As the interview was adapted for use in adults the confound nonetheless continued to emerge, albeit less frequently, in cases in which a high level of abstraction was evident. In particular interviewers were struck by the interchangeability of these terms in persons with origins in non-Western cultures. This has been noted by others as well. Damasio has made some highly interesting speculations about the lack of equivalently contradistinguished terms in some (for example Romance) languages and about the historical emergence and widespread use of “conscience” as a term long before the emergence and currency of the term “consciousness” (Damasio, 1999).

Pertaining to the adult part of the lifespan, Cloninger and his colleagues (1993) have presented a psychobiological model of temperament and character. While this model is not restricted to adult moral functions or adult moral identity, it is strikingly compatible with the conscience domains Stilwell et al have described in children and adolescents.⁴ Cloninger et al's current model identifies seven dimensions, the first four are dimensions of temperament, the latter three of character: **novelty seeking, harm avoidance, reward dependence, persistence, self-directedness, cooperativeness, and self transcendence.**

There is not a domain in Stilwell et al's study of Conscience comparable to **novelty seeking**, however all of the domains of conscience seem to be established on the *ground of Moral Engagement* which sometimes lends itself to metaphoric (but perhaps not altogether metaphoric?) descriptions as appetitive or even passionate, for example as 'thirst' or 'hunger' or 'craving' for justice. Kagan (1998) has effectively articulated this idea in chapter three of **Three Seductive Ideas**:

Although the content of every set of moral standards is tied to some time and place, the desire to believe that self is ethically worthy, like the ability to understand language is universal. Humans are the only species that applies a symbolic evaluation of good and bad to actions, thoughts, feelings and personal characteristics and tries continually to choose acts that make it easier to regard the self as good.... A moral motive and its attendant emotions are as obvious a product of biological evolution as digestion and respiration... (p.155).

Phenomenologically, it may be important to distinguish moralized appetites from moralized emotions. The conscience domain of *Moral Emotional Responsiveness* which has psychophysiologic, internal anxiety, external anxiety and mood components seems closely related to **harm avoidance** although it also includes reparation and healing-motivated by the psychophysiologic, anxious and emotional alterations in the be good/feel good setting on the moral emotional barometer. These are homeostatic regulatory mechanisms that control the internal milieu and, we speculate, probably rely upon very basic neural structures in brainstem and hypothalamus, under the influence of higher structures. **Reward dependence** is viewed as a heritable bias in the maintenance or continuation of ongoing behaviors and is manifest as sentimentality, social attachment and dependence on approval from others. The relationship to our domain of *Moral Attachment* is readily apparent although attachment, we think, does not reduce entirely to a temperamental dimension. This is not meant to imply that the capacity for attachment is not heritable.

In Cloninger's model, the three personality factors based on differences in self concepts are denoted as *character dimensions*. **Self-directedness**, the major determinate of the presence or absence of personality disorder, refers to self-determination and "willpower" or the ability of an individual to control, regulate, and adapt behavior to fit the situation in accord with individually chosen goals and values. Will is seen as a metaphorical abstract concept to describe the imaginal self as an integrated, purposeful whole individual, rather than a disorganized set of reactive impulses. There is prima facie correspondence of **Self-directedness** with our developmental domain *Moral Volition* and the closely related subdomain *Self-derived Valuation*, when these are brought together in a conceptualized organic unity. **Cooperativeness**, the impairment of which is associated with all categories of personality disorder, is the second character factor. Cooperative individuals are described as socially tolerant, empathic, helpful and compassionate. We have associated these virtues with the Conscience domain *Moral Emotional Responsiveness* (Galvin & Stilwell, 1997) but there also seems to be a close relationship to the domain of *Moral Attachment* and the subdomains of *Peer-derived and Authority-derived Valuation*. brought together in a conceptualized organic unity. Cloninger's character factor **Self Transcendence** refers generally to identification with everything conceived as essential and consequential parts of a unified whole. While not necessarily a domain of spirituality, Conscience Conceptualization organically unifies and epigenetically transforms the supporting domains of conscience in a personally meaningful way. See Table 3.

Table 3.

**CORRESPONDENCE BETWEEN CONSCIENCE DOMAINS
AND TEMPERAMENT & CHARACTER FACTORS**

Cloninger et al.	Stilwell et al.
<i>Novelty seeking</i>	<i>Moral Engagement</i>
<i>Harm avoidance</i>	<i>Moral Emotional Responsiveness</i>
<i>Reward dependence</i>	<i>Moral Attachment</i>
<i>Persistence</i>	*
<i>Self-directedness</i>	<i>Moral Volition, Self-derived Valuation</i>
<i>Cooperativeness</i>	<i>Moral Emotional Responsiveness, Moral Attachment, Peer-derived and Authority-derived Valuation.</i>
<i>Self Transcendence</i>	<i>Conceptualization</i>

CONSCIENCE AND MALTREATMENT

Having described the state of the field of the study of conscience development in preschool, school age and adolescence and drawing comparisons with the study of personality in adulthood, we next examine the specific effects of maltreatment on conscience. That there are effects specific to the experience of maltreatment to oneself (or to someone close) is suggested by comparing the effects of other forms of adverse life experiences on conscience formation and functioning. In a study of victims of the 1988 earthquake in Armenia, it was found that adolescents in the city near the epicenter manifested advanced moral development compared to their counterparts in another less affected city. They nonetheless had elevated levels of psychopathological interference correlated with the severity of their post-traumatic stress disorder symptoms. The authors concluded that in the aftermath of a catastrophic natural disaster, children assume greater responsibilities and confront a multitude of morally challenging interpersonal situations, advancing their moral development. This advancement in development does not come without cost: there is pathologic interference with actual conscience functioning. The implication, however, is that the victims of natural catastrophe may be assisted to integrate the horror of their traumatic experiences and the harshness of post-trauma adversities into an adaptive schema of good and evil in themselves and the world (Goenjian, Stilwell, Steinberg, Fairbanks, Galvin, Karayan, Pynoos, 1999). Presumably, the meaning given by a child to adverse life events contributes to the substantiation and valuation of his/her identity and may be of utmost importance in furthering or hindering progress along his/her moral developmental trajectory.

Maltreated children have problems in peer relations especially regarding simple and complex equalities (Mueller & Silverman, 1989). In a study of 10 abused, 10 neglected, and 20 nonmaltreated preschool children it was found that the abused group was less likely than the comparison group to judge hypothetical behaviors with consequential hypothetical harm as impermissible (Smetana and Kelly, 1989). An investigation of aggression,

withdrawal and prosocial behavior in physically abused, non-abused but neglected and neither abused nor neglected children yielded the following results. Physically abused children displayed the most aggression, non-abused but neglected children the most withdrawal and neither abused nor neglected children the most prosocial behavior. Only inclusion of all three dimensional variables discriminated the maltreatment groups fully in a multivariate analysis. The abused group became the most accurately classified only when the absence of prosocial behavior was taken into account.

Domains of conscience development affected by maltreatment have been investigated in youth in an intermediate length stay psychiatric hospital. A sample of psychiatrically hospitalized boys was divided according to whether or not they had been maltreated before 36 months of age. Those who had suffered the earlier trauma were significantly more delayed in conscience development than those never maltreated or those enduring maltreatment only after that age. Both emotionally disturbed groups were less proficient in conceptualizing their personal conscience and less sufficient in reporting self- and peer- derived rules they felt obligated to follow than their age and sex matched normal counterparts. Divided according to the presence or absence of early maltreatment, the emotionally disturbed boys were not significantly different from each other with regard to overall delay in conscience development. However, boys maltreated early in life differed significantly from normal counterparts in being delayed in domains in which boys spared early maltreatment were not. Namely, the boys maltreated early in life had troubles:

- a) utilizing feelings of anxiety and mood to inhibit antisocial behavior,
- b) utilizing reparation and healing to reinstate moral-emotional equilibrium after wrong-doing,
- c) perceiving attachment figures as caring about and affirming their moral goodness,
- d) processing values related to respecting and feeling protected by authorities, and
- e) developing skills and attitudes related to becoming a responsible person now and in the future.

With respect to psychopathological interference scores, which were made in addition to developmental scores, there were fewer differences between the hospitalized boys divided according to early maltreatment experiences. Again, those maltreated early had more psychopathological interference than normal counterparts in all domains. While those without early maltreatment had severe emotional disturbances requiring a level of intervention comparable to that required by the early maltreated boys, they nonetheless reported using reparative and healing measures as effectively as, and respecting their peers as much as, their normal counterparts did (Galvin, Stilwell, Shekhar, Kopta, and McKasson, 1997).

The SCI is an invaluable diagnostic as well as therapeutic tool to elicit moral meanings (for a detailed case report, see Ammerman and Galvin, 1998). On the other hand it is time-consuming both to conduct and to score. Hence, it would be fortunate if clinical traces of conscience formation and functioning could be discerned in the specific items culled from familiar and widely used dimensional parent and child measures of psychopathologic interference. Clinicians could then utilize these as conscience sensitive critical items. Two widely used dimensional measures of psychopathology are the Achenbach Child Behavior Checklist (CBCL) for parents and the Achenbach Youth Self Report (YSR) for youth 11yrs or older (1985).

For purposes of study, specific items were culled from the CBCL and YSR *a priori* by, and required the agreement of, both senior authors (MG and BS) to be considered indicators of psychopathologic interference in the conscience domains. Two conscience domains appeared to be represented with face validity on the CBCL. The first one was Moral Valuation represented by two of its three sub-domains: authority-derived (9 items) peer-derived (7 items). Only one item (#35) pertained to the third sub-domain, self-derived valuation (self worth). However an ambiguity (perhaps reflecting a general tendency in folk and academic psychology, to sometimes consider valuation affective in nature) had been introduced by use of the word 'feels' in this item. CBCL item #35 was therefore included among the items for Moral Emotional Responsiveness, the other conscience domain appearing to be represented on the CBCL (4 items). Conscience domains appearing to be represented on the YSR were also:

Authority derived Valuation (9 items), Peer-derived Valuation (5 items), and Moral Emotional Responsiveness (4 items). In addition, on the YSR, adaptive, as opposed to psychopathic, functioning in both conscience domains Moral Valuation and Moral Emotional Responsiveness appeared to be represented by 4 items, identified as Prosocial (PS). Although there were items pertaining to interference in more general developmental domains such as cognition, attachment, and autonomy on the CBCL and YSR, the domains of conscience derived from them through moralization: conscience conceptualization, moral attachment, and moral volition, did not appear to be specifically represented. See Table 4.

Table 4.

**PSYCHOPATHOLOGIC INTERFERENCE
CONFIGURED BY CONSCIENCE DOMAINS**

CONSCIENCE DOMAIN	CBCL ITEMS	YSR ITEMS
Moral Valuation		
Authority:	22. Disobedient at home 23. Disobedient at school 43. Lying or cheating 67. Runs away from home 72. Sets fires 81. Steals at home 82. Steals outside the home 101. Truancy, skips school	22. I disobey my parents 23. I disobey at school 43. I lie or cheat 67. I run away from home 72. I set fires 81. I steal at home 82. I steal from places other than home 101. I cut classes or skip school
Peer:	15. Cruel to animals 16. Cruelty, bullying or meanness to others 37. Gets in many fights 57. Physically attacks people 97. Threatens people	--- --- 37. I get in many fights 57. I physically attack people 97. I threaten to hurt people
Moral Emotional Responsiveness		
	26. Doesn't seem to feel guilty after misbehaving 31. Fears he/she might do something bad 35. Feels worthless or inferior 52. Feels too guilty	26. I don't feel guilty after doing something I shouldn't 31. I am afraid I might think or do something bad 35. I feel worthless or inferior 52. I feel too guilty
Prosocial		
		15. I am pretty honest 80. I stand up for my rights 98. I like to help others

The moralization of attachment, which gives rise to the security-empathy-oughtness link may, to some extent, be biologically constrained by sensitive periods of time in human development (Galvin et al., 1995, 1997, Kandel, 1983, 1985, 1998; McEwen, 1989, 1999; Perry & Pollard, 1998; Perry, 1998). During these periods, parental expectations of moral growth may not comport well with developmental realities. Parents may perceive the child as delayed in conscience formation and/or impaired in conscience functions, and may be subject to overvalued ideas, for example, that a particular moral emotion must be robustly evinced in order for the child to meet a *conditio sine qua non* for having a conscience. Such distortions may reverberate or viciously spiral as aggravating factors which predispose the child to harsher and harsher punishment. How do measures of psychopathologic interference vary (in the domains of conscience particularly) according to the age at which the adolescents completing their reports had endured childhood maltreatment? The specific working hypothesis was:

Compared to other adolescent inpatients, those who endured maltreatment at earlier ages rate themselves as subject to more impairment in the domains of conscience functioning.

Pilot data was collected and analyzed at Indiana University Department of Psychiatry Riley Child and Adolescent Section (Walsh et al, unpublished manuscript). Subjects were 54 adolescents, male and female, consecutively admitted to a small acute psychiatric inpatient unit between 1991 and 1993. They were grouped according to age at onset of maltreatment:

EARLY: on or before 36 months (N=19),
MIDDLE: between 36 months and 72 months (N=6)
LATE: on or after 72 months (N=14), and
NONE (N= 15).

These groups were comparable in age, gender ratio, and diagnostically (with the exception that PTSD was prevalent in the EARLY and MIDDLE groups but absent in the LATE and NONE groups). Neglect was more prevalent and the period of maltreatment was longer in the EARLY group. Physical Abuse and Sexual Abuse were not more prevalent in any particular group but, like Neglect, did have later ages of onset in the sequence EARLY<MIDDLE< LATE.

Scores on Achenbach CBCL and YSR broad bands, sub-scales and specific items rationally selected as indicators of perceived conscience functioning were compared. There were no significant group differences on the externalizing and internalizing broad band or sub-scales. There was a statistically significant difference among groups with respect to their mean scores of rank in each of the domains of conscience. Additional comparisons within the four groups demonstrated significant group differences in Authority-derived Valuation and Peer-derived Valuation but not Moral Emotional Responsiveness or Prosocial as characterized on CBCL and YSR. Examination of the descriptive statistics for the conscience domains suggested:

- i) Greater psychopathologic interference in authority derived valuation, reflected by the highest scores on items rationally selected from the YSR, was found in the EARLY and MIDDLE maltreatment groups
- ii) Greater psychopathologic interference in peer derived valuation was found in the EARLY maltreatment group with the exception that the LATE maltreatment group was more apt to engage in fighting
- iii) Greater psychopathologic interference in moral emotional responsiveness was found in the MIDDLE maltreatment group with the surprising exception that the NONE group scored itself higher than any maltreatment group on lack of guilt and lower than any maltreatment group on fear of doing something bad.

On the Achenbach Prosocial items, the EARLY maltreated adolescents least strongly endorsed honesty and helpfulness, The MIDDLE maltreated adolescents least strongly endorsed standing up for their rights but most strongly endorsed being willing and liking to help others in need. The LATE maltreated adolescents most strongly endorsed standing up for their rights and the NONE group least strongly endorsed willingness to help others. Victim perceptions may well be at odds with the non-perpetrating (as well as perpetrating) parents' perceptions.

This perceptual discrepancy is by no means unique to the differential diagnosis of maltreatment as may be anticipated from Famularo et al.'s (1992) more general study which carefully notes the differences in diagnoses suggested by child vs. parent versions of the DICA. From the child's point of view, being related to the perpetrator may contribute to a moral identity experienced in part or whole as deeply flawed and unworthy. How do agreement and congruence of measures of psychopathologic interference vary generally, and in the domains of conscience particularly, according to whether or not the parents completing their reports had engaged in childhood maltreatment? In the aforementioned pilot study (Walsh, et al, unpublished manuscript) the maltreated adolescents consecutively admitted to an acute psychiatric inpatient unit were also grouped according to whether or not the parent completing the Achenbach Child Behavior Checklist had engaged in child maltreatment. Of the 54, a total of 39 had endured maltreatment. In 7 of these 39 cases, the parents who had engaged in maltreatment completed the ratings for their adolescents. These 7 cases comprised the MALTREATING PARENT GROUP (MPG) and were compared to 32 cases that comprised the COMPARISON PARENT GROUP (CPG). Scores on Achenbach CBCL and YSR broad bands, sub-scales and specific items rationally selected as indicators of perceived conscience functioning were compared.

The specific working hypotheses were:

- 1) Compared to non-perpetrating parents, perpetrating parents perceive their maltreated children as subject to more externalizing and less internalizing psychopathological interference with adaptive functioning,
- 2) Positive correlations between the non-perpetrating parent and child are more likely than that between the perpetrating parent and child on dimensional measures of psychopathology,
- 3) Compared to non-perpetrating parents, perpetrating parents perceive their maltreated children as subject to more psychopathologic interference in the domains of conscience functioning

MPG and CPG were comparable in: their mean age (173 ± 10 mos. and 176 ± 19 mos., respectively) and age range; male to female ratio (4:3 and 14:18, respectively) socioeconomic level as determined by father's education and employment and the adolescent's Medicaid status; prevalence of ADHD and the disruptive behavior disorders, PTSD, other anxiety and depression disorders as well as substance abuse; diagnostic density (# diagnoses per adolescent); the presence of physical abuse in the history, and number of kinds of maltreatment experiences. There were no significant group differences with respect to age at onset of sexual abuse or neglect or duration of maltreatment experiences. The entire group of subjects who were physically abused by their mothers endured the onset of maltreatment earlier in their lives than subjects physically abused by anyone else ($p < 0.02$ by t test, $p < 0.04$ by Wilcoxon 2 sample test).³ The ratios representing those adolescents who had endured maltreatment by one, two and more than two perpetrators were significantly different ($p = 0.014$ by Mann-Whitney test). In further exploration, subjects who had CBCL's completed by their mothers were regrouped according to whether or not their mothers had engaged in the maltreatment. A significant difference did emerge with respect to age at onset of physical abuse. Among children rated by their mothers, those who had been maltreated by their mothers, alone or among other perpetrators were significantly younger ($10 \text{ mos} \pm 11$) at the age of onset of the maltreatment experience compared to those who were maltreated by non-maternal perpetrators ($51 \text{ mos.} \pm 32$; $p = 0.0157$ by two-tailed t test; $p = 0.04$ by Wilcoxon 2 sample test).

Hypothesis 1 was not confirmed in this study. While the sample size was too small to draw any definitive conclusions, there were no significant group differences with respect to the CBCL broad band t scores or significant group effects, by two way ANOVAs, on the externalizing and internalizing sub-scales. Wilcoxon 2 sample tests also demonstrated no group differences with respect to the externalizing and internalizing sub-scales. In addition it was not found that higher externalizing t and lower internalizing t scores distinguished MPG from CPG.

Hypothesis 2 was partially confirmed in this study. While there were positive correlations between reports of adolescents and parents who had not engaged in maltreatment, there were no positive correlations between reports of adolescents and the parents who had maltreated them.⁵

³ The MPG and CPG groups also differed in this respect, but interpretation warranted caution due to limited frequency of observations in the MPG cell.

Of particular interest, in spite of the small sample size, hypothesis 3 was supported by this study. There were statistically significant differences between groups with respect to mean scores of rank in the following domains of conscience (as characterized by parents): Authority-derived Valuation, Peer-derived Valuation and Moral Emotional Responsiveness).

Examination of the descriptive statistics for the conscience domains suggested that, compared to other parents of maltreated adolescents, parents who engaged in the maltreatment viewed their adolescents as subject to greater psychopathologic interference in:

- i) Authority-derived valuation reflected by more disobedience at school, running away from home, stealing at home and elsewhere, truancy and vandalism, but not disobedience at home or lying/cheating
- ii) Peer-derived valuation reflected by more cruelty, destructiveness and engagement in fighting but being less likely to attack or threaten others
- iii) Moral emotional responsiveness reflected by being less likely to evince guilt after misbehaving, being less fearful that he or she might do something bad and having more feelings of worthlessness.

Fragmentation of moral meaning can be attributed to at least two factors. The first is extrinsic to the child: caregivers and clinicians may not have the means ready at hand to provide the child opportunities for framing moral meanings. The second factor is an intrinsic one: a person who has been maltreated early in life, constructs meanings of the maltreatment experience from fragmentary, implicit, scarcely retrievable, dissociated memories which nonetheless exert dire influences as her/his conscience works to make moral meanings. What meanings result? Clearly, a handful of items on a dimensional rating scale will not tell the whole tale (but do tell there is a tale to be told).

Psychological phenomena and their development are best discerned through a variety of approaches. Moral meanings represented richly are hard to come by in standard mental status evaluations of children. Semi-structured interviews like the Stilwell Conscience Interview glean the fruits of personal meaning making, and enable the discovery of 'the moral', so to speak, of a child's life story. Structured interviews demonstrate the reliability of measuring agreed upon features of the phenomenon of interest. Dimensional instruments add the feature of degree to measurement. Multiple informants add perspectives.

Clinicians are more or less accustomed to consider psychiatric diagnoses in a multiaxial but somewhat disconnected conceptual mode. Market and ideological forces sometimes do not reward or even actively discourage inclusion of 995 and V-codes on Axis I and a natural reluctance to encode Axis II diagnoses in children is shared by many clinicians. What may suffer is diagnostic coherence. Consider the following:

Axis I: Neglect of Child (Victim)
Physical Abuse of Child (Victim)
Suspected History of Post Traumatic Stress Disorder,
Untreated
Parent –Child Relational Problem
Depression Not Otherwise Specified
History of Conduct Disorder, Adolescent Onset, resolved
Disruptive Behavior Disorder, Not Otherwise Specified

In this set of diagnoses, although confined to Axis I there is already a chronicle implied and, from the developmental psychopathological standpoint, a call to make that chronicle more explicit, in order to explain, to integrate and to conceptualize it. Too often in practice only 'Depression Not Otherwise Specified' will actually be encoded on the grounds it alone may warrant reimbursement.

In the light of the aforementioned heuristic expansion of Axis II, it is possible to have a fuller appreciation

of the *trans*-axial nature of psychopathology in maltreatment. Symptomatology weighing in favor of Axis 1 diagnoses emerges from --and may become submerged again and undergo further transformations in-- developmental psychopathology. Conscience sensitive diagnosis makes for a fuller appreciation of this process.

Some Axis I diagnoses associated with maltreatment experiences (e.g. Depression, Conduct Disorder) rely upon criteria that correspond, straightforwardly, to delay and/or psychopathological interference in some developmental domains of conscience. In other diagnoses the compromised formation and functioning in conscience domains is encrypted in the criteria (e.g. Dissociation and PTSD). In particular, inferential work is required to appreciate the correspondence of DSM criteria to valuational and volitional domains of conscience. See Table 5.

Table 5.

**Sequelae of Maltreatment Conceptualized According to DSM-IV
Relating to Domains of Conscience**

Axis I	Criterion	Relevant Conscience Domains	
Major Depressive Episode	A - 7	feelings of worthlessness	Self-derived valuation
		excessive guilt	Moral-emotional responsiveness
	A - 8	indecisiveness	Moral volition
	A - 9	suicidal ideation	Self-derived valuation
Dysthymic Disorder	B - 4	low self-esteem	Self-derived valuation
	B - 5	difficulty making decisions	Moral volition
	B - 6	feelings of hopelessness	Moral valuation
Dissociative Identity Disorder	A	two or more distinct identities	Conscience concept (Moral identity)
	B	at least 2 of these identities recurrently takes control of the person's behavior	Moral volition
Conduct Disorder	A	repetitive and persistent pattern of behavior in which basic rights of others or major age appropriate societal norms and rules are violated	Authority-derived valuation
			Peer-derived valuation
PTSD	C - 5	feeling of detachment	Peer-derived valuation
			Moral attachment
	C - 6	restricted range of affect	Moral emotional responsiveness
	C - 7	sense of foreshortened future	Self-derived valuation

Case Vignette #1:

14 year old girl

Residential Treatment Center

Reason for Referral: “Because I have numerous runaway charges and I violated probation and I assaulted a girl. The probation officer thought a locked facility was best.” The reason of record is that she is a client in need of a structured environment as she is ‘beyond her parents’ ability to control her’. She has a history of runaway behavior and most recently ran from her group home. She also has a history of verbal and physical aggression toward peers and staff.

Chief Complaint: “I did go to a doctor for depression. The doctor took me off the Paxil and put me on Celexa, a kissing cousin of Paxil.”

Intellectual Functioning: WISC-III, Verbal IQ 87; Performance IQ 79, Full Scale IQ 81. Her academic achievement scores by the WIAT were below predictions based on her cognitive abilities.

On her Youth Self Report, she has a total T score 72, Internalizing T 68, Externalizing T 75.

DSM IV:

Axis I: Victim of Sexual Abuse and Possibly of Neglect, perceiving her mother as being emotionally negligent and allegedly physically abusive. She has some symptoms of PTSD and Major Depressive Disorder. Substance Abuse, principally Cannabis. Rule Out Bi-Polar Disorder. At one point, she was thought perhaps to have Attention Deficit Hyperactive Disorder.

Axis V: Current GAF: 45-50

Adverse Life Experiences:

She indicates that when she was little, her mother was not there for her. She later indicates that her mother left the family when she was nine, leaving a four page letter. She says that her mother neglected her educational needs and gives examples that her mother would promise to come to school activities and not show. She went to live with her dad for a period of time. She returned to live with her mother, getting her father’s permission to do so, and then she went to a group home because she “could not stay” with her mother, she would just run away. She denies having observed domestic violence but does recall her parents yelling at one another. She says, “I basically took care of myself. My dad tried really hard but he couldn’t handle me.” Referring to her mother as well as her resolve to do better by her own children, she says, “You can’t mess up a child’s life because it reflects on them when they get older.” At ten years of age she experienced a rape by her uncle. In the course of it he made threats against her life. He was not charged with rape. Instead, she decries, “The case was treated as a molest.” She conveys the information, with some perplexity and indignation, that her uncle was an alcoholic but managed to do whatever he wanted. Asked about other experiences of physical abuse, she queries back, “Is it considered abuse if you are hit by something besides a hand and it leaves bruises? Mom would use pieces of wood or a belt or would have her boyfriend hold me and she would whip me leaving bruises and welts. Once she used a fireplace shovel on me.” Nonetheless, she never received medical attention. She says that her bruises were “just treated with ice.”

Conscience Functioning:

Conceptualization: She has heard of the word conscience.

She likens it to a voice in her head telling her she shouldn't do this or in case she does something [she shouldn't] that she will get into trouble. She says "But I never listen to it. I don't hear it that often." She was recently made aware of her conscience when she was out late past curfew and a police car came by. She told herself, "I'm busted."

Moral Attachment: The first good thing that she can remember doing was receiving a tribute from father when he told her she was nice. She believed (and believes) his sincerity. She says that when her mother praises her, it does not make her feel better. She associates her mother with making the statement "You disappointed me a lot."

The first bad thing she can remember doing was being underneath the car with her brother when she was six. He showed her how to smoke a cigarette. They were caught by her mother who disapproved. She recalls having been caught by her mother again when she was seven. That time, she and her brother were made to smoke cigars until they became dizzy and then were whipped with part of a cutting board.

Moral Emotional Responsiveness: She can experience her own conscience "busting her" without police coming by. She says whenever she yells at somebody who does not deserve it, she feels badly afterwards. She localizes this bad feeling to her head. She says that apologies and the hope of forgiveness may make her feel better. If she is forgiven, "it's good", if not, she feels worse. Asked if she has had the experience of *unforgiveness*, she said that she has experienced lack of forgiveness from her mother. She associates the condition of unforgiveness with getting into an altercation with her mother, being hit by her mother and hitting her mother in return. She says, "I body slammed her and she's still afraid of me."

When she has done something good and nobody knows about it, she harbors the thought "See they don't care. There is no point to doing this." When she has done something bad and nobody knows about it, she characterizes her inner states as: "Ha Ha, they didn't catch me. That's their problem, not mine."

Moral Valuation: When asked if she has any rules to live by, she says if she made up her own rules, she would stay out until 10:30, go to school but on her own time, get a job, live on her own and eat what she wants. She puts a premium on independence. She says, "I value that more than anything else that you've written down." She sees herself as putting herself down a lot, as being subject to self-devaluation.

Moral Volition: She says, "When I take responsibility my mom doesn't like it, and when I don't take responsibility she still doesn't like it. She tries to be the boss of me-- doesn't realize I've taken care of myself."



Case Vignette #2:

13 year old boy

Residential Treatment center

Reason for Referral:

His understanding: is that “I was molesting my cousins.”

On record: he is a child in need of a sexual offender program.

Chief Complaint: “I miss home.”

Intellectual Functioning: IQ of 113 in the referral information. There is no information on what instrument was used for obtaining this IQ.

Adverse life experiences

He counts as a major adversity not being able to see his grandmother. The reasons for this prohibition are not fully given. He says that his grandmother did not think that he needed to come to the Residential Treatment Center.

Grandmother apparently disputed with his mother about this and also talked with his father, such that his mother believed that grandmother would interfere with his treatment. He says that his parents divorced when he was two or three and he does not think that was a good thing. He is aware that his mother was subjected to alleged domestic violence before he was born but he does not recall any while he was with his biological parents. He is aware that his mother has had “some difficulties with men” since then.

DSM IV: Axis I: 1) Sexual Abuse of Children as Perpetrator;

2) Probable Conduct Disorder; Possible Substance Abuse;

3) History of ADHD

Axis V: Current GAF: 35-40

Conscience Functioning:

Conceptualization: He has heard of the word conscience and, with a small smile, says “a little voice to tell you what to do.” He denies he has one now but allows that he may have had one once, he cannot say when. The conscience is “a part of your brain and your brain is a tangled mess-- so I don’t know.”

Moral Attachment: When asked about the first thing he could remember doing that was good, he replies “nothing.” Despite urging, he retrieves no memory of approval. When asked about the first thing that he did that was wrong, he needs no prompting and says, “lots of things” but spontaneously specifies “molesting.” He perceives his grandmother as caring most about whether he is good or bad but is unable to identify how she shows her concern. Still she is “the only one” who appreciates when he does good things.

Moral Emotional Responsiveness: He says when he has done something good, “it does not matter.” When he has done something bad and nobody knows about it, nothing particular happens inside him; however, if someone does know about it, he says, “I wish I wouldn’t have done it.”

Moral Valuation: Asked about Do’s and Don’ts in his life, he says, “I don’t have any.” Nonetheless, he is able to identify that he values his grandmother. He is unable to identify any behaviors that he practices to uphold the value of this relationship.



Moral Volition: He is aware of a time when he decided not to do something wrong that he thought he might want to do. He decided not to smoke weed. He said "No" because he did not want to but adds that he did not want to get caught. He is aware of thinking consequentially prior to engaging in the molestation but decided in favor of the urge even at the risk of being caught.

In the case vignettes, one of victim, one of perpetrator (whose victimization must be inferred), Axis I and V have been deliberately isolated and juxtaposed against adverse life experiences from the youth's point of view, and the responses to questions regarding conscience. While the examination of conscience may seem too time consuming to implement routinely as part of clinical assessment, these case vignettes attest to the contrary. Each has been extracted from a complete psychiatric evaluation based upon interviews conducted routinely in a 1.5 hour timeframe for clinical -- not research -- purposes. The inclusion of these questions allows for a more meaningful mental status evaluation. Indeed, current practice parameters for psychiatric assessment of children and adolescents specify that "conscience and values" should be assessed: conscience specifically in terms of "age appropriate development, specific areas of harshness, laxness, or conflict; effectiveness in helping child conform to expected family and community norms." (AACAP, 1997)

Additional Conscience Images of Maltreated Children

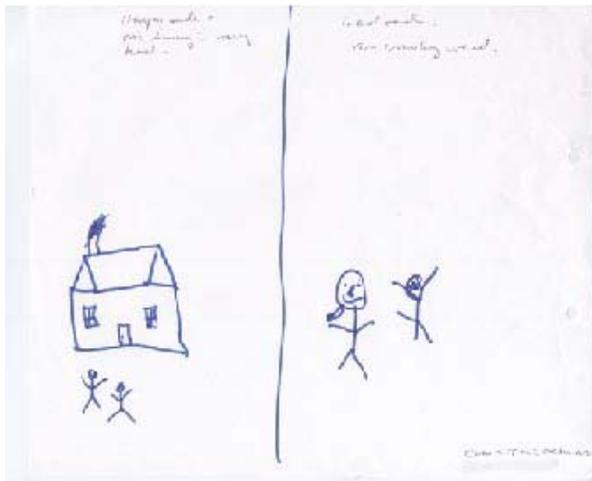


Conscience Drawing

"Before:
the way I used to be
-stole car stereos and speakers."



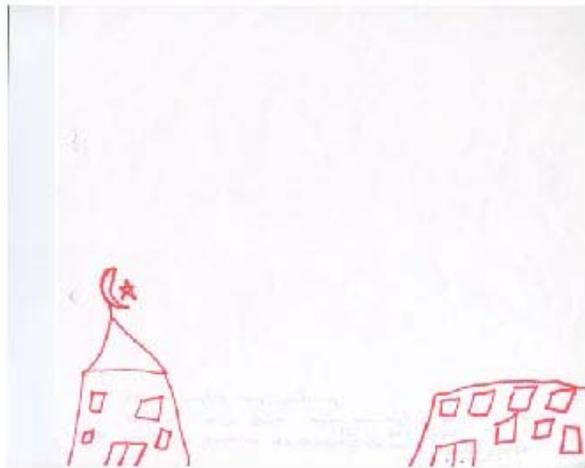
"Today"



Conscience Drawing

"happy side: me living with my kid"

" bad side: me smoking weed"



Conscience Drawing

15y boy

' here's the mosque
and here's the jail.
I have to choose.
My brother helps me
sort things out.'



Conscience Drawing

14 y old girl

" Like on each shoulder
tells you different things to do....
This is not my conscience-
My mind tells me what to do."



Conscience Drawing

14 y old boy



Conscience Drawing

13 y old boy

" Some little evil dude
that thinks about bad stuff
Tells me to do things that are wrong."



Conscience Drawing

Adolescent girl

"Good: nice and bright, halo, jewelry, belt, ring, and [a] buckle [on her] shoes: [Her] hair is fixed, [She has] bright blue eyes, shining with joy: proud."

"Bad: dark, gloomy, ugly, disrespectful; black lipstick, fat, horns like the devil."

"I'm kinda in the middle-more on the good side."



Conscience Drawing

14y girl



Conscience Drawing

16y girl



Conscience Drawing

16y boy

" My conche on my shoder telling me what is rong and wright to do"



Conscience Drawing

17y boy

"The closed flower is like when I do something-not good or bad-just anything. The open flower represents my conscience being open to talking about the things I do. The sun behind represents the bright affect I have on people. I am nice and glowing. The tears off the leaf represent that sometimes I have sad moments."

- The first three drawings are similar in some respects to the drawings collected from advantaged children. The artists make use of two pages or a division of a single page to concretely depict examples of good and bad, right and wrong. This is consistent with the externalized conscience represented by advantaged children having a modal age of six. However the persons of conscience who have rendered their images here are not children. They are adolescents. This suggests delay in the development of conscience concept.

- The next general point to note is that the contents of these drawings may include representations of age expectable issues and preoccupations; for example the use and abuse of vehicles and substances. However, they also have content that varies markedly from those of the advantaged children, none of whom represented their experience of wrongdoing in any way comparable to “doing cars,” or with an aggregate of gang symbol, hand-gun and blunt. Nor did they represent right-doing as “me living with my kid.”

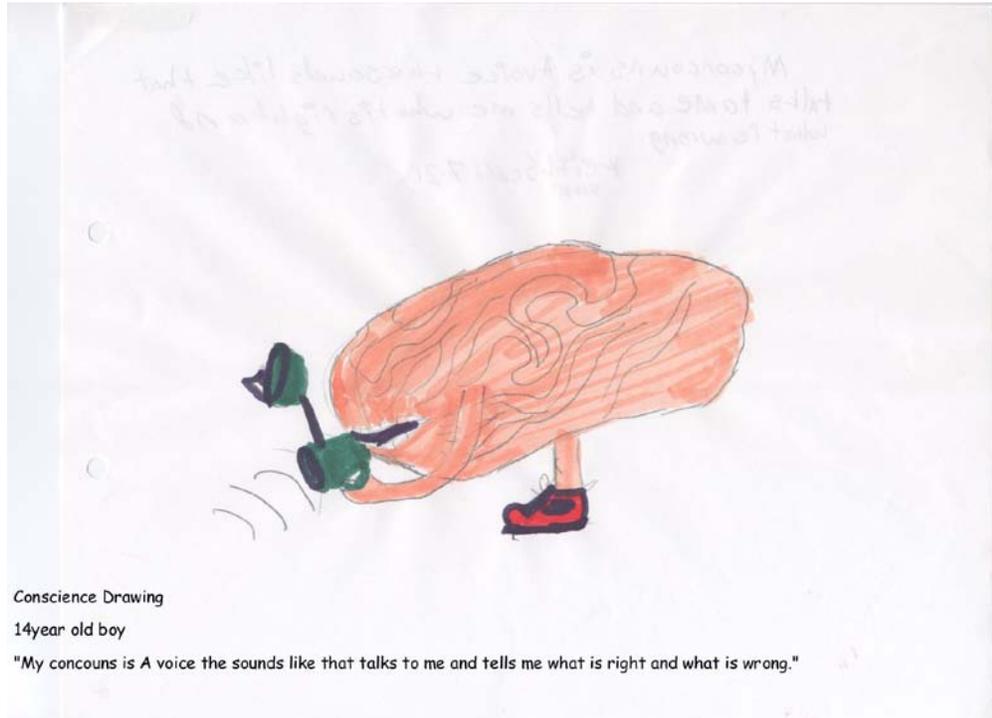
- Particularly poignant is an image rendered by a 15-year-old boy whose conscience positions him between a detention center and a mosque.

- Angels and devils seem as commonplace in the conscience imagery of maltreated adolescents as they are in drawings from advantaged adolescent and younger children but it may be noted that in the last of these three drawings the angel is conspicuously absent. Conscience is identified as telling the youth to do bad things.

- The use of a divided paper to depict good and bad conscience persists in the conscience imagery of some maltreated adolescents and may be related to the dynamism of splitting. Note the reliance of one youngster upon external goods (more aesthetically than morally valuable) to bolster a fragile sense of well-being. In another case, her mindfulness of good and bad days in life is represented as passive rather than agentic.

- The final two illustrations are images rendered by sexually reactive adolescent boys. Use of the Stilwell Conscience Interview and Imagery may assist both in assessment and in attaining treatment goals relevant to victim awareness and empathy, values clarification and impulse inhibition (AACAP, 1999).

**AXIS III EXPANDED:
DEVELOPMENTAL PSYCHOBIOLOGY**



Axis III is where physical conditions related to the other axes are encoded. Axis III has obvious utility for recording sequelae of battering and sexual molestation such as can be discerned by physical examination and available laboratory, x-ray or neuroimaging studies that may be clinically indicated. Failure to thrive or, in extreme cases, the marasmic effects of child neglect could be recorded here. However Axis III also may be appropriated for heuristic purposes to call attention to putative neurobiologic, hormonal, and immunologic sequelae of maltreatment which may or may not have functional significance and may or may not correlate with the psychiatric and developmental sequelae encoded on Axis I and II, respectively and/or in a more direct way with the variables related to maltreatment on Axis IV. On Axis III expanded for heuristic purposes, we conceptualize heritable biological factors underlying temperament and biological factors underlying adaptive/maladaptive, adverse/nonadverse learning necessary for character formation. The hierarchical principles involved in the complex mental processes underlying construction of meaning parallel the evolutionary development of brain functioning. A review of developmental neurobiologic studies across the animal kingdom (e.g. Benes, 1991) is akin to watching a staged theatrical performance in which precisely timed developmental events orchestrated by genetically determined programs and cell-cell interactions form dramatic movement across the stage. Tragic interferences in anatomical development occur when genetic defects or environmental insults mar the process during the period of neurogenesis (the first trimester in humans), causing gross teratogenic or structural defects in brain development. Later appearing genetically expressed disturbances or environmental insults are more likely to affect neuronal connections in the brain, producing subtler defects (Coyle, 1987).

Epigenetic, environmental modulation of genetic factors facilitates development of the central nervous system, resulting in neurite outgrowth, neurite pruning, synaptogenesis and synapse withdrawal (Leckman, 1991). While most of these processes are thought to be preprogrammed and uninfluenced by anything other than highly adverse and physical environmental experiences, it has been suggested that only a fifth of the brain's neurons are genetically preprogrammed, leaving the remainder as areas of flexibility upon which experience can work, forming the basis of learning (Werry, 1991).

Environmental influences on the brain and, therefore, on learning are inversely related to age (Kandel, 1985). Three ontogenetic stages of synapse modification are suggested. The first stage, synapse formation, is under genetic and developmental control. The second stage, fine tuning of newly developed synapses, is under the control of appropriate and timely patterns of environmental stimulation. The third stage, regulation of transient and long-term effectiveness of synapses, occurs throughout later life and is determined by day to day experiences.

In an overview of the field of developmental psychopathology provided by Emde and Spicer, particulars, variations and unique aspects of experience are examined in the context of meaning. Incorporated in the changing view of early development are three currents: advances in knowledge of genetics and the changing brain, awareness of the complexity of early emotional development and increasing appreciation for the diversity of early experience in cultures of the world. There is bi-directionality between brain and behavior. Elaborating upon Kandel's work, the authors note that some synaptogenesis is experience expectant, such that the expected experience generates predictable patterns of neural activity making it possible for certain synaptic connections to be selected for preservation with time-limited plasticity. Other synaptogenesis is experience-dependent allowing plasticity in responding to specific features of the environment. Human emotions are not reactive, intermittent, disruptive states. Instead they are complex, active, ongoing and organized processes that serve adaptive purposes. Adverse experiences with attachment figures are associated with emotional dysregulation and behavioral problems. Experiences of developing children are shaped in powerful ways by individuals in transaction with the systems of meaning that are at the center of contemporary anthropological definitions of culture. Developmental experiences in turn shape cultural meanings (Emde and Spicer, 2000). It would be a serious omission in the account of development to overlook the role of the internally constructed 'environment' termed 'conscience' in its reciprocally dynamic relationship to genetic, social and cultural influences.

Incorporating the concepts of ontogeny and biological learning into the definition of developmental psychopathology, development expresses the maximal evolutionary potential for learning while psychopathology defines specific phenomena that interfere with the realization of that potential. Maladaptive learning is particularly implicated in the development and perpetuation of psychopathologic syndromes associated with extreme stress.

A HERITABLE TRAIT FOR CONSCIENCE FORMATION?

In a classic version of the social learning approach moral inhibitions are conceptualized as conditioned avoidance responses. Because they have been punished for wrongdoing in the past and experienced aversive emotions, children come to experience anxious arousal even in the absence of the socializing agent (Kochanska, 1993). Mowrer (1966,1974 reviewed by Zahn-Waxler & Kochanska, 1990, and by Gorenstein & Newman, 1980, respectively) identified common concepts in psychoanalytic and learning theory by linking the concept of anxiety with conditioned fear and the notion that behaviors associated with the termination or reduction of anxiety are reinforced. The execution of a deviant act involves a sequence of response-produced cues, each providing sensory feedback. Punishment may occur at various points in the sequence and so lead to the relatively direct association of a fear response with the response produced cues occurring at the time of punishment. If punishment occurs following transgression, fear will be associated with stimuli accompanying the deviant act. If punishment occurs earlier, it should be associated with the preparatory responses and the emotion of fear and should be more effective in preventing deviation (Zahn-Waxler & Kochanska, 1988). Mednick and Hutchings developed a different two factor theory for the psychopath's avoidance deficit. They cited low skin conductance recovery rate, which suggested delayed reduction of anxiety such that the inhibition was not strongly reinforced (Gorenstein & Newman, 1980).⁶

In a chapter entitled *The Biosocial Basis of Learning Morality*, Mednick proposed that the operation of the genetic influence in criminality could be relatively nonspecific (e.g. general intelligence) or could be via some physiological predisposing factor or factors, or both. He constructed a theory that specifies an autonomic variable which seems heritable and which could conceivably play some role in the etiology of antisocial behavior.

How do children learn to inhibit aggressive impulses?
Child A is aggressive to Child B

Child A is punished by a censuring agent (parent, teacher, peer)
Child A contemplates aggressive action to another child
Child A acquires anticipatory fear of punishment
Child A inhibits the aggressive impulse
Child A's anticipatory fear dissipates.

The reduction of Child A's fear is a powerful, naturally occurring reinforcement for inhibition of aggression. In order to learn morality the child needs:

- 1) A censuring agent (typically family) AND
- 2) An adequate fear response AND
- 3) The ability to learn the fear response in anticipation of an asocial act AND
- 4) Fast dissipation of fear to quickly reinforce the inhibitory response.

The Fear Response is controlled by the ANS. Indicants are heart rate, blood pressure and skin conductance (Mednick, 1981).⁷

Raine and Venables (1984, cited by Quay) found a significant negative correlation between ratings of antisocial behavior and galvanic skin response (GSR) amplitudes. Delamater and Lahey (1983 cited by Quay) also demonstrated lower skin conductance levels during a continuous performance task for preadolescents rated high on conduct problems using the Conners Teachers Rating Scale. Schmidt (1985, cited by Quay) found a lower GSR responsivity to a loud bell in the Conduct Disorder group compared to normals. Many of these results are consistent with a framework described by Gray and elaborated by Fowles in which behavior is under the control of a Behavioral Inhibition System indexed by GSR and a reward system indexed by heart rate (Quay, 1987). Fowles (1987, 1994) provided an overview of the state of this field, concluding (1987) that a series of studies had shown that heart rate might be significantly influenced by appetitive motivation such as performance-contingent monetary incentives during performance of a continuous motor task but did not respond to aversive stimulation in the form of feedback failure. Conversely, nonspecific skin conductance fluctuations did respond to aversive stimulation.

A putative temperamental factor conferring resistance to the development of conduct disorder has been variously termed: "inner tension," (Dienstbier, reviewed by Zahn-Waxler and Kochanska, 1989; Zahn-Waxler, Klimes-Douglas, Slattery, 2000) or "body dysphoria" (Kagan, 1998, p.180) are two examples. It is seen as disposing a person to self-examination. Generally not given full consideration is the possibility that the genetic expression of this temperamental factor is susceptible to adverse environmental modulation which, *in extremis*, may result in a disconnection with emerging conscience functions.

Conduct Disorder, like Antisocial Personality Disorder (APD), is generally seen as having both heritable and environmental etiologic factors. Lyon et al. (1995) compared DSM-III R antisocial personality symptoms before 15 years of age vs. after 15 years of age. This was a twin study of 3226 pairs of male twins from the Vietnam Era Twin Registry. They were interviewed by telephone using the DIS Version III. Biometrical modeling was applied to each symptom of antisocial personality disorder and summary measures of juvenile and adult symptoms. They found five of twelve juvenile symptoms were significantly heritable, five others were significantly influenced by shared environment. In contrast eight of ten adult symptoms were significantly heritable and the shared environment influenced one. Shared environment explained about six times more variance in juvenile antisocial traits than in adult traits. Shared environmental influences on adult antisocial traits overlapped entirely with those on juvenile traits. Additive genetic factors explained about six times more variance in adult vs. juvenile traits. The juvenile genetic determinants overlapped completely with genetic influences on adult traits. The unique environment explained the largest proportion of variance in both juvenile and adult antisocial traits. They concluded that characteristics of the shared or family environment that promoted antisocial behavior during childhood and early adolescence also promoted later antisocial behavior, but to a much lesser extent. Genetic causal factors were much more prominent for adults than for juvenile antisocial traits. The investigators assumed that the behaviors described in DSM reflected a latent trait that influenced probabilistically the likelihood of carrying out certain behaviors. They hypothesized characteristics such as sensation seeking and impulsivity that would mediate between genes and observable antisocial behavior.

Cadore et al. (1995) reported on an adopted away study of 95 males and 102 females, 18-42 yrs old at the

time of the study, separated from birth from biologic parents with documented (by prison and hospital records) APD and their adoptive parents undertaken to determine the effect of an adverse adoptive home environment on adoptee conduct disorder, adult antisocial behavior and two measures of aggressivity. Using multiple regression analysis they showed 1) a biologic background of antisocial personality disorder predicted increased adolescent aggressivity, conduct disorder and adult antisocial behaviors and 2) adverse adoptive home environment (marital problems, divorce, separation, anxiety conditions, depression, substance abuse or dependence or legal problems) independently predicted increased antisocial behavior. Interactive effects resulted in increased aggressivity and conduct disorder in adoptees in the presence but not in the absence of a biologic background of antisocial behavior. They concluded that environmental effects and genetic environmental interaction accounted for significant variability in adoptee aggressivity, conduct disorder and adult antisocial behavior.

To explain Conduct Disorder appeals have been made to Quay's elaboration of Gray's hypothesis (Rogeness, Javors & Pliszka, 1992, also see: Quay, 1993, Rogeness, 1994). In brief, primary brain systems are identified. These include the Behavioral Inhibition System (BIS), and the Reward or Behavioral Facilitatory System (BFS). The BIS acts as a comparator and inhibitor of behavior. It responds to nonreward, punishment and uncertainty. The Behavioral Facilitatory System (BFS) is action without restraint (examples: extraversion, sexual behavior, aggressive behavior) and mobilizes behavior so that active engagement occurs. Quay's Hypothesis is that severe and persistent undersocialized conduct disorder has its biological foundations in an imbalance between the BIS mediated by NE and serotonergic neuronal pathways and BFS mediated by dopaminergic pathways.⁸

NE is thought to play an important role in the modulation of behavior and even in the internalization of values (Rogeness, et al., 1992). The central NE system is one of the first neurotransmitter systems to develop and so may be especially vulnerable during early life (Coyle, 1987). The relative strength of the BFS (dopaminergic system) and BIS (NE/serotonergic systems) would theoretically influence this process over time and behavior at a given point in time. BALANCE is the key word (Quay et al, 1987; Quay, 1988; Rogeness et al., 1992).

NEUROTRANSMITTER RESEARCH FINDINGS

Studies have implicated the NE system with data consistent with decreased NE activity being associated with an increase in conduct symptoms. The biologic data (decreased sympathetic tone or responsiveness as measured by skin conductance and resting heart rate and measures of NE metabolism in Conduct Disorder) are consistent with decreased NE activity being associated with some forms of Conduct Disorder. Decreased NE activity is consistent with the model of subjects with Conduct Disorder conditioning less well to signals of punishment and therefore being more likely to have deficits in internalization of societal rules (Rogeness, 1994).

Some studies on serotonergic functions in adults reported at the end of the last decade have had follow-up or drawn support from newly designed studies in 1996. Coccaro and his associates had evaluated central 5HT functions in relation to impulsive aggressive behavior in adults. Following a single dose challenge with fenfluramine, a serotonin releasing/uptake inhibiting agent, prolactin responses were measured as a "promising index of overall central serotonergic activity". Their results suggested that self- and other- directed impulsive, aggressive behaviors in patients with personality disorders were associated with reduced central serotonergic function (Coccaro, et al., 1989). In their new study they examined the relationship between binding parameters of the platelet central serotonin transporter and measures of aggression and impulsivity in adults.⁹ They concluded that this might represent another abnormality in serotonergic function in individuals with personality disorder and aggressive behavior (Coccaro, 1996). Virkunen and associates (1989) had correlated recidivism in adult firesetters and violent offenders with the biological variables of lower serotonin metabolites in cerebrospinal fluid. In their 1996 report on alcoholic violent offenders and fire setters, Virkunen et al. confirmed their earlier findings of low metabolites in recidivists vs. non-recidivists. They also found that the recidivists' developmental histories were remarkable for paternal absence from and presence of brothers in the home.

Several studies in children and adolescents have been consistent with adult studies and an association between decreased serotonergic function and Conduct Disorder (Rogeness, 1994). When selective serotonergic agents have been used clinically to treat aggression, their effects have appeared acutely in contrast to their antidepressant and anxiolytic actions. This has suggested that the therapeutic anti-aggressive effects may be related

to the acute activation of serotonergic receptors rather than to the down-regulatory changes that appear after long term treatments (Zubieta and Alessi, 1993). However, actual studies of dopamine and its metabolite thus far have not demonstrated a difference in subjects with and without conduct disorder (Rogeness, 1994).

The much sought after heritable factor(s) for sociopathy already recognized as interactive with adverse environmental conditions, may soon be identified (CHROMOSOME 11: D4DR, regulating dopamine, has been proposed as the link to novelty seeking; LL FORM 5HT1Db, serotonin receptor gene, to aggressiveness) but, we doubt it (or they) will provide a completely satisfying explanation for sociopathy, because the same heritable factor(s) may be, like other dimensions of temperament, susceptible of moralization, contributing to the contours of conscience in the novelty seeking or impulsive individual a proclivity to engage in the moral adventure, sometimes impetuously, sometimes courageously (cf. Putman, 1997). On the other hand there are identifiable adversities such as maltreatment that may lead to demoralization in the sense of an impaired ability to sustain the development and functioning of the organic unity that we call conscience.



THE PSYCHOBIOLOGY OF MALTREATMENT

Interactive stress responsive systems. Since maltreatment involves acute and/or enduring psychosocial stressors (termed Type I and/or Type II trauma, Terr, 1991), a knowledge of interactive stress responsive systems in a developmental context is essential in guiding the study of neurobiologic sequelae. One theoretical account of the consequences of maltreatment in humans is that abusive, neglectful experiences contribute to intrinsic neuropsychiatric vulnerabilities that predispose the child to behavioral problems inviting more caregiver frustration and more abuse (Lewis et al., 1988; Lewis, 1992; 1994). The interactive stress responsive systems (Chrousos and Gold, 1992) likely to be involved in maltreatment include neurotransmitter and neuroendocrine (hypothalamic-pituitary- adrenal, - thyroid, -growth hormone and - gonadal axes) as well as the immune systems.

Laboratory animal studies have identified receptor changes associated with prolonged exposure to glucocorticoids released in response to stress (Sapolsky, Krey & McEwen, 1985). Naturalistic studies of primates subordinated in their social hierarchy have demonstrated endocrine alterations (Sapolsky, 1982; 1989) as well as hippocampal damage (Uno, Tarara, Else, Suleman and Sapolsky, 1990). There is also evidence pertinent to neglect derived from animal models. Nonhuman primates who have experienced abnormal rearing practices have consistently demonstrated emotional and social impairments (Harlow, Dodsworth & Harlow, 1965; Harlow, 1980; Suomi, 1985; 1991). With regard to biologic sequelae, animal research has demonstrated impairments in the central noradrenergic system. For example, mother-deprived rhesus infants were found to have lower levels of cerebral spinal fluid NE than mother reared infants (Kraemer, Ebert, Lake, and Mckinney, 1984; Kraemer, Ebert, Schmidt, & McKinney, 1989).

Recall that the latter three character dimensions in Cloninger's model involve conceptual learning which is conscious and abstractly symbolic (cf. explicit or narrative memories that can be intentionally retrieved). Hippocampal processing and long-term storage in association cortex appear essential. Lesion studies in humans and other primates show that conceptual information is processed and stored in a cortico-limbic-diencephalic system including:

1. higher order sensory areas of the cortex
2. the entorhinal cortex

3. the amygdala
4. hippocampal formation.
5. the medial thalamic nuclei
6. ventromedial prefrontal cortex
7. basal forebrain (Cloninger, 1993).

On the other hand in taking the perspective that conscience is moralized consciousness, one is obliged to return to model of proto-self, core consciousness and extended consciousness, of which conscience is conceived as a refinement (Damasio, 1999). The neuroanatomy hypothesized as underlying the processes behind the proto-self (and object) includes brainstem nuclei, the hypothalamus and certain somatosensory cortices. Underlying core-consciousness, the cingulate cortices, the thalamus and the superior colliculi are likely suspects (1999, pp. 193-194). Based upon lesion studies, Damasio indicates hippocampus and amygdalae are not implicated in **core**-consciousness. Nor are the ventromedial or dorsolateral aspects of the prefrontal cortex. When it comes to **extended** consciousness, however, there are implicated several higher order cortices including parts of limbic cortices and numerous subcortical nuclei, including the amygdalae, that hold dispositions and are potentially contributory (1999, p.333).

While the role of the hippocampus may be negligible in supporting core consciousness, as Damasio argues persuasively (1999, pp. 270 and 333), its role in extended consciousness can not be dismissed. The amygdala, considered important in aspects of prosocial development related to empathic responsiveness (Brothers, 1989), may share with the hippocampus and other brain structures and pathways vulnerability to maltreatment effects mediated by intense or prolonged stress responses. Theoretically, neurobiologic sequelae of maltreatment may involve alterations in receptor numbers, morphological changes in the neuron, modification of the processes of synaptogenesis and synaptic pruning and even neuronal death. Some forms of psychopathology have been attributed to learning gone awry. For example, Kandel (1983) proposed a molecular explanation for chronic anxiety involving structural changes in the number and distribution of synaptic vesicles as well as the size and extent of their active zones. He argued that the acquisition of chronic anxiety is a learned process that creates morphological changes (demonstrated in the animal model) altering the functional expression of neural connections. Furthermore, it was proposed that such learning is likely to involve enduring, self-maintaining alterations in gene expressions. More directly relevant to maltreatment, Kandel proposed similar alterations when maltreatment occurs during developmentally critical periods (Kandel, 1985).

Consideration of neurobiologic processes in adult **PTSD** implicates similar processes in childhood maltreatment. Strong evidence suggests that noradrenergic (NE), dopaminergic, opiate and Hypothalamic-Adrenal-Pituitary (HPA) neuronal systems and the locus coeruleus (LC), amygdala, hypothalamus, hippocampus and prefrontal cortex are involved in PTSD. Moreover, sophisticated gene-environment interactions are implicated in proposals to account for symptoms associated with chronic PTSD (Charney, Deutch, Krystal, Southwick, 1993).

In a similar vein, Post (1992) proposed a detailed mechanism of how psychosocial stress associated with initial episodes of **affective disorder** may sensitize an individual to further episodes, some of which may occur spontaneously. The initial experience kindles neurobiological changes encoded at the level of gene expression. Neuronal transmission sets into motion intracellular changes at the level of gene transcription; transcription factors (e.g. proto-oncogene, c-fos) bind at DNA sites and induce mRNAs for other substances exerting even longer range effects. Enduring changes in neurotransmitters, receptors and peptides may be the biochemical and anatomical basis for synaptic adaptations and memory that can last indefinitely.

Depression, or Conduct Disorder illuminates- but only indirectly-the neurobiology of maltreatment. For more direct illumination it is necessary to apply our knowledge of the **developmental neurobiological** factors involved in **learning** and in **stress responses** to the **variables of maltreatment** because maltreatment involves both adverse learning processes and psychosocial stressors at the extreme of caregiver casualty. For a comprehensive review of the state of the field including animal models of uncontrolled and unpredictable stress, the implications of studies in adult PTSD and the few direct investigations into the neurobiology (or psychobiology) of maltreatment, see De Bellis and Putnam (1994) who note that the specificities, if any, of different forms (character) of maltreatment for various neurobiologic systems remain to be explored. Perry and

Pollard (1998) have provided a more recent review of traumatic stress effects on neurodevelopment in children, emphasizing that trauma induces a total brain response, and that children's developing brains are more vulnerable to trauma than adults. Whereas traumatic events modify an adult's original state of homeostasis and organization, in children, these same events become the original organizing experience itself.

Psychobiologic study according to the maltreatment variable, character: Abnormal cortisol levels have been found in sexually abused girls, implicating altered glucocorticoid functions in the hypothalamic pituitary adrenal axis (HPA), (Putnam, Trickett, Helmers, Susman, Dorn, and Everett, 1991). Plasma Adrenocorticotrophic Hormone response to ovine corticotropin- releasing hormone is reduced in sexually abused girls compared with control subjects (De Bellis, Chrousos, Dorn, Burke, Helmers, Kling, Trickett & Putnam, 1994). Corticotropin-releasing hormone and locus coeruleus-NE/ Sympathetic systems participate in a positive reverberatory feedback loop (Chrousos and Gold, 1992), hence alterations in NE functioning might also be anticipated in sexually abused girls. Findings support the idea that sexually abused girls have higher catecholamine functional activity compared to controls (De Bellis, Lefter, Trickett, & Putnam, 1994). In a study of emotionally disturbed children (Rogeness, 1991), subjects with a history of neglect plus abuse, compared to subjects without maltreatment were found to have lower urinary NE.

Psychobiologic study according to the maltreatment variable, age at onset: NE is converted from dopamine by the enzyme *Dopamine-beta-hydroxylase* (D β H). In fact D β H is used in immunohistochemical studies to locate NE neurons (Charlton, McGadey, Russell, and Neal, 1992; Ginsberg, Hof, Young, and Morrison, 1993). Serum D β H has properties making it a possible marker of early abuse/neglect effects on the NE system (Galvin, Shekhar, Simon, Stilwell, Ten Eyck, Laite, Karwisch and Blix, 1991; Galvin, Ten Eyck, Shekhar, Stilwell, Fineberg, Laite and Karwisch, 1995). Serum D β H activity increases particularly in the first 24-36 months of life with little further increase after 72 months of life (Weinshilboum, Raymond, Elveback and Weidman, 1973; Weinshilboum & Axelrod, 1971; Freedman, Ohuchi, Goldstein, Axelrod, Fish and Dancir, 1972). Environmental adversity occurring at an early age when the D β H enzyme activity is unstable (indicative of vulnerability in the NE system) may have quite different effects than environmental adversity later in life. In psychiatrically hospitalized boys there were no differences in D β H activity between maltreated (defined as neglected, physically abused or sexually abused) and nonmaltreated groups-provided age at onset of maltreatment was not considered; however, when age at onset of maltreatment was taken into account group differences were discerned. The group of boys who had been subjected to maltreatment before 72 months of age had lower serum D β H than groups of boys who had been subjected to maltreatment later on or had not been subjected to maltreatment. Interestingly among boys who were diagnosed with Conduct Disorder Solitary Aggressive type (CDSA) those who were not maltreated at an early age had even lower D β H activity than those who were maltreated at an early age who, in turn, were lower in D β H activity than boys neither maltreated nor diagnosed with CDSA. Analogously to Post's model of the transduction of stress into depression, it was hypothesized that genetically determined D β H activity might be modulated by prolonged exposure to glucocorticoids released as part of the stress response. (Galvin et al., 1991, 1995).

TOWARDS THE PSYCHOBIOLOGY OF CONSCIENCE

Consequently, while low serum D β H is implicated as a neurobiologic marker for the transduction of stress associated with early maltreatment into CDSA, studies to date by no means settle the matter conclusively. Low serum D β H could instead be a biological marker for a genetic trait or maturational delay associated with vulnerabilities to develop CDSA provided other environmentally adverse conditions such as extremes of caregiver casualty obtain. In any event, low D β H may mark a psychobiologic trait, either heritable or associated with maturational delay or the sequelae of maltreatment that comprises the underlying biotype for a phenotype of externalization and impulsiveness. The child may then fail to modulate impulses by internal controls and fail to evince moral emotional responses such as guilt and remorse that have become overvalued by the caregiver(s). The caregiver, in spite of over determined valuation of certain kinds of moral emotional responses from their child, may nonetheless share more or

less the same biotype and phenotype with the child and so be subject generally to low frustration tolerance and lack of internalized control. These caregiver traits interact with inappropriate developmental expectations of the child thereby compromising the stage salient tasks of parenting, and move the caregiver to extremes along the continuum of casualty. Depending on the critical period of development the child is in, stressful interactions with the caregiver may further alter the child's biotype in a way contributing to developmental psychopathology identified on Axis I and/or Axis II. Further studies are required that are sensitive to gender effects, are based on carefully ascertained cases of maltreatment, are well characterized and contradistinguished in regards to important variables of the maltreatment experience, and are controlled for confounding diagnoses such as conduct disorder as well as factors such as loss, poverty and exposure to urban violence, which in themselves constitute prolonged stressors likely to have as yet poorly understood psychobiologic sequelae. There will likely be additional implications of a multiaxial approach to sequelae of maltreatment for the psychobiology of conscience as neuroimaging and assessment of conscience functions in health and psychopathology become more refined.

What has been emphasized elsewhere (Galvin et al., 1997) bears repetition: conscience functioning is not confined to behavioral inhibition. Moral-emotional responsiveness requires behavioral action and commitment in the processes of reparation and healing as well as prosocial behavior. The domains of moral self valuation and moral volition are related to the maintenance of self-esteem and the developmental progression from autonomy to moral agency. These conscience functions will likely be found to depend upon neuromodulation different from that involved in behavioral inhibition. In any event, it will be surprising indeed if the complexities of conscience are not matched in complexity by its psychobiological basis.

The brain insult visited by maltreatment is not so readily apparent as the injury sustained by Phineas Gage when a railroad spike, transformed into a missile by an accidental explosion, penetrated his frontal lobes (Damasio, 1994). Nonetheless, each child who has endured early maltreatment and demonstrates delay or psychopathologic interference in moral development may have hidden bruises or scars in the form of neurobiologic markers. Maltreated children elicit our empathic responses and, if we are concerned citizens, motivate us to protect victims and support prevention programs, if we are in the healing professions, to dedicate ourselves to their care and recovery. Yet each maltreated child may also be a modern day Phineas Gage from whom we have much to learn, allowing us to make sense of their neurobiological markers in terms of the psychobiology of conscience, the heart of the human personality.

Summary. The sequelae of maltreatment have been conceptualized according to the DSM IV multiaxial system expanded for heuristic purposes. Axis I and Axis IV were expanded to take into account important variables of maltreatment. The differential Axis I diagnoses were identified with special emphasis placed on PTSD, Dissociation, Depression and Disruptive Behavior Disorders. Axes II and III were heuristically expanded to call attention to development and developmental psychopathology, particularly in the domains of conscience, and associated putative neurobiological sequelae of maltreatment, indicating a pathway to the psychobiology of conscience. Conscience sensitive assessment of maltreated children was illustrated with two case vignettes and selected conscience drawings. A trans-axial, conscience sensitive approach to DSM has been proposed as a corrective. There will likely be additional implications of the study of maltreatment for a more general psychobiology of conscience as neuroimaging and assessment of conscience functions in health and psychopathology become more refined.

ENDNOTES

¹ This unpublished manuscript presents the results of a study led by Kelda Harris Walsh, M.D. while completing her child psychiatry fellowship at I.U., under the supervision of her co-author MG. This pilot study suggests that specific items culled from a widely used dimensional rating scale of psychopathology and configured according to the domains of conscience are sensitive to the effects of one or more maltreatment variables while broadband and narrow band scores, apparently, are not. It remains to be rigorously determined whether the effects discerned in this way are also to be found in conditions and disorders other than those associated with maltreatment. The paper was submitted for anonymous peer-review to **Child Abuse and Neglect** in 1999. Concerned with the complex and highly conceptual nature of the material, the focus upon psychiatric inpatients (making generalization problematic), as well as the small sample size, the reviewer recommended and encouraged that the material be presented in a concept paper with data support rather than with statistical testing. In the spirit of the reviewer's recommendation and consideration of the contribution to the field that Walsh et al. have made, their study, *qua* pilot data, is adduced as support for concepts in the current work and described in more than the customary detail. For interested readers, the methods and statistics that were applied in the study are described as follows.

After application of exclusion criteria, the subjects were 54 adolescents (28 boys, 26 girls) consecutively admitted to a small, acute psychiatric inpatient unit at a university teaching hospital between spring 1991 and spring 1993. Psychiatric diagnoses were made clinically, according to DSM III-R (APA, 1987) criteria. Discharge diagnoses are reported. Patients with diagnoses of pervasive developmental disorders, schizophrenias, mental retardation and organic brain syndromes were excluded. Admission evaluations were conducted by a psychiatry resident and social worker directly supervised by one of the authors (MG) who required maltreatment histories be routinely obtained as part of the psychiatric evaluation. MG also conducted a psychiatric interview.

At a minimum, maltreatment was characterized clinically in terms of kind (sexual abuse, physical abuse and/or neglect), age at onset, duration, relationship of the victim to the perpetrator, and the number of perpetrators. Reviews of completed psychiatric evaluations were conducted independently by MG and three raters (a nurse practitioner, an ACSW and a child psychiatry resident: see acknowledgments) who utilized a screen for maltreatment described in previous studies (Galvin, et al, 1995; Galvin et al, 1997). Scores for inter-rater agreement (Winer, 1971) among the four reviewers of ten randomly selected cases were calculated for the following fields of the maltreatment data base: **degree of certainty about maltreatment**: definite abuse (0.88), possible abuse (0.91), abandonment and definite neglect (1.00), possible neglect (0.84); **kind of abuse**: physical abuse (0.97), sexual abuse (0.97); **continuum of caregiver casualty**: harsh discipline (0.72), inadequate discipline (0.62), prolonged separation (0.71); **age at onset** of maltreatment: on or before 36 months (almost 100% agreement), after 36 months (0.87). A third group became evident and our hypotheses regarding psychobiologic sequelae of maltreatment further evolved (Galvin, et al., 1995) as we were conducting this study. In subsequent analysis of the data, an additional division of age at onset was made: between 36 months and 72 months and on or after 72 months, yielding four maltreatment groups altogether: early, middle, late and none.

Statistical Analysis was conducted with SAS® version 6.12 (1990). ANOVA, Wilcoxon 2 sample tests T test and Mann-Whitney Tests were used for Hypothesis 1. Pearson and Spearman Correlations were used for Hypothesis 2. Cronbach's Coefficient Alpha was used to test internal consistency of the items rationally selected from the Achenbach CBCL and YSR and configured according to the Conscience Domains. Hypotheses 3 and 4 were examined in two ways: with Friedman's Chi Square test (two way analysis of variance of ranks) and Mann-Whitney Tests.

2. The counter-argument marshaled produces the effect that neither theoreticians nor clinicians should be wholly uncritical of the notion of developmentally critical-or sensitive- periods. "The allure of infant determinism" is second among the ideological currents in developmental psychology targeted by Kagan in his book **Three Seductive Ideas**. The author disputes "...that experiences during the child's early years (especially the biological

mother's affectionate care and interactive play with her infant) are the most potent force in shaping a life."(p.83). He proceeds to a critical review of Attachment research methodology (the Strange Situation) and interpretation of findings therefrom, particularly the theoretical construct designated by the term "working model." (p.102ff). Just to the extent this aspect of attachment theory is affirmed, it shapes the interpretation of constructed relational meanings of all sorts, whether these meanings are called worldview, moral meaning or conceptualization of conscience (apropos our preceding comments regarding sense of violation and moral meaning making). Kagan is concerned to dispute expectations that nurture or neglect and conditioned emotional reactions established early in life are sustained in the absence of the conditions which led to them in the first place. On the view he promotes, much does hinge upon the interpretation of experience but that interpretive capacity attends development into the third and fourth years of life (p.116).

In a related point, the demonstration of biological markers of maltreatment occurring at particular periods of development is only a small first step in a process that must also demonstrate correlations with functional categories subsumed by the varieties of consciousness, including conscience. Apropos this point, Kagan writes: "...Consciousness is best described as a set of emergent phenomena that require brain processes but are not equivalent to them..." (p.40). While very intriguing speculations regarding functions abound, they are nonetheless speculations awaiting specific arguments posed in terms of agents, targets and contexts susceptible of empirical validation. (p.82).

Interpretations of our studies (with respect to psychiatrically hospitalized, seriously and persistently ill boys) include:

- 1) Severe maltreatment experiences at an early age putatively correlate with a severe kind of conduct disorder.
- 2) Severe maltreatment experiences occurring at an early age (before the child's development of interpretive capacities) putatively correlate with delays and pathological interference in conscience functions and
- 3) Severe maltreatment experiences occurring at an early age putatively correlate with a biological marker;

The word "putative" is used to reflect that the findings have not been replicated and that they may be criticized from the standpoint of methodological difficulties. For example, applying aspects of Kagan's critique, the child's or adolescent's retrospective interpretation of maltreatment was not adequately characterized.

The causal relationships among our three putative findings are matters of speculation, but, we hope, not idle speculation. "Not idle" because, irrespective of whether the findings of our (or similar) studies prove true or untrue, the invitation to this speculative activity promotes a habit of conceptualizing multi-axial diagnosis, fully and meaningfully.

3. But, for cautionary comments, cf. Kagan, 1998 who devotes pp.112-150 in **Three Seductive Ideas** to the subject of the child's interpretation of experience.

4. Cloninger et al (1993) note that five factors, plus or minus two, account for most variation in personality between individuals in the general population. Two factors, neuroticism vs. stability and extraversion vs. introversion are consistently described in the literature. There is less consistency about the third factor, variously identified as tough-mindedness, constraint and openness to experience. In a popular five-factor model, two additional factors are conscientiousness and agreeableness. Second, they argue that the five-factor model does not capture some domains of personality such as individual autonomy, traditional moral values, and other aspects of maturity and self-actualization described in humanistic and transpersonal psychology.

5. Using Pearson and Spearman Correlations to check the linear tendency of CBCL and YSR broadband and sub-scale scores, it was found in the MPG that there was either no correlation or, in the case of the sub-scale "thought problems" a negative correlation (-0.85 by Pearson Correlation Coefficient), between the adolescent's self report

and the maltreating parent's report. The difference between groups with respect to correlations of CBCL and YSR "thought problems" was significant ($p=0.04$). Of interest as an exploratory finding was the negative correlation of CBCL "thought problems" with 5 of the 6 YSR internalizing sub-scales. In the CPG, on the other hand, there were positive correlations in the externalizing broadband and both externalizing sub-scales, "delinquency" and "aggression" and also a cross correlation between CBCL "aggression" and YSR "delinquency." There were no correlations among the internalizing sub-scales except for positive correlations between the adolescent and the parent on the "somatic" sub-scale.

6. A more complete historical account might begin with Cleckley. Cleckley formulated the essential features of and popularized the term for psychopathy in **The Mask of Sanity** (1964). Cleckley characterized psychopathy (now referred to as sociopathy or antisocial personality disorder) as inability to learn from experience and engaging in antisocial behavior attributable, in part, to a hypothesized underlying deficit. A considerable portion of the literature on psychopathy has attempted to delineate the hypothesized underlying deficit with an emphasis on deficient anxiety conditioning in anticipation of punishment and on poor passive avoidance (learning not to make a response that will be punished). Hypoactive electrodermal skin response (the current term for galvanic skin response-GSR- or skin conductance) has been taken as an index of poor anxiety conditioning and the passive avoidance deficit has been viewed as a laboratory analog of impulsivity seen clinically (Fowles & Missel, 1994).

Lykkens' 1957 study on psychopathology in adults involved three groups: psychopathic criminals, neurotic criminals, and noncriminals. Subjects were set a task, a mental maze, with choice points at which the subject chose to press one of four levers. Only one choice was correct. The manifest task was to complete the mental maze with as few errors as possible. In addition, one of the three incorrect levers, when pressed, resulted in an electric shock. So the latent task was to avoid those particular errors that entailed painful consequences. There was no difference between groups in their ability to learn the manifest task, however, psychopaths exhibited no improvement in the ratio of shocked to unshocked errors while the others were able to reduce this proportion (reviewed in Gorenstein & Newman, 1980, Fowles 1987, Fowles and Missel, 1994).

Hare (reviewed by Gorenstein and Newman, 1980, and by Mednick, 1981) Trasler and others (cited by Mednick, 1981) discussed the possibility that the psychopath and criminal have some defect in avoidance learning which interferes with their ability to learn to inhibit asocial responses. Hare suggested that this was autonomic hyporeactivity. Hare's subjects were grouped in the same way as those of Lykkens. Subjects were set the task of observing the numbers 1-12 appearing through the window of a memory drum. In the second trial, subjects were told a shock would be delivered each time the number 8 appeared. Skin conductance was monitored. In the psychopathic group, but not in comparison groups, the skin conductance did not rise until the number 8 was imminent. This phenomenon was called a steep temporal gradient of fear arousal and appeared to be a deficit in classical conditioning involving the failure of early temporal cues (Conditioned Stimulus) to elicit an emotional response (Conditioned Response) even when the cues were reliable predictors of a subsequent aversive event.

7. Damasio gives a more sophisticated view in line with recent developments in neuroscience. In *Descartes Error*, Damasio (1994) argues that we rely upon somatic markers to make judgements. These markers are acquired by experience, under the control of an internal preference system (consisting of mostly innate regulatory dispositions, posed to ensure survival of the organism, inherently biased to avoid pain, to seek potential pleasure and, moreover, to achieve these goals in social situations) and under the influence of an external set of circumstances which include not only entities and events with which the organism must interact but also social conventions and ethical rules. The critical formative set of stimuli to somatic pairings is acquired in childhood and adolescence but the accrual of somatically marked stimuli ceases only when life ceases. In what sounds a little like Mednick's biosocial learning of morality, only not restricted to the emotion of fear, Damasio (1994) writes:

When the choice of option X, which leads to bad outcome Y, is followed by punishment and thus painful body states, the somatic marker system acquires the hidden, dispositional representation of this experience driven, non inherited, arbitrary connection. Reexposure to option X, or thoughts about outcome Y will

have now the power to reenact the painful body state and thus serve as an automated reminder of the bad consequences to come.

8. Important areas of central NE activity are the locus coeruleus, the lateral tegmental areas and (along with serotonin) the Papez Loop, identified as part of the BIS in Quay's Hypothesis (Quay, Routh, Shapiro, 1987; Quay, 1988). Components of the BFS are thought to be integrated in the mesolimbic dopamine system.

9. In Cloninger's model the temperamental dimensions are postulated to be genetically independent of one another and defined in terms of individual differences in associative learning in response to novelty, danger or punishment and reward. Persistence shares with these temperamental dimensions the essential feature of involving automatic, preconceptual responses to perceptual stimuli (cf. associative learning, unconscious habits, and implicit or procedural memory), presumably reflecting heritable biases in information processing by the perceptual memory system. This involves the cortical-striatal system including the sensory cortical areas and the caudate and putamen; but hippocampal processing is not required. Examined more closely, **novelty seeking** is viewed as the heritable bias in the activation or initiation of behaviors such as frequent exploratory activity in response to novelty, impulsive decision making, extravagance in approach to cues for rewards, and quick loss of temper and active avoidance of frustration. The relationship to Fowles' appetitive motivational system and Gray's/Quay's BAS is readily apparent. **Harm avoidance** is viewed as a heritable bias in the inhibition or cessation of behaviors, such as pessimistic worry in anticipation of future problems, passive avoidant behaviors such as fear of uncertainty and shyness of strangers and rapid fatigability. Again, the relationship to Fowles' aversive motivational system and Gray's/Quay's BIS is readily apparent. Someone with ASPD then has the following stimulus response characteristics: high in novelty seeking (implicating dopamine), low in harm avoidance (implicating serotonin) and low in reward dependence (implicating NE) (Cloninger, 1987).

10. They measured the maximal number of platelet tritiated paroxetine binding sites and dissociation constant values in 24 patients with personality disorder and 12 healthy volunteers. In patients with personality disorder but not healthy volunteers, measures of aggression and impulsivity were inversely correlated with the maximal number of platelet tritiated paroxetine binding sites but not the dissociation constant.

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* Denotes recommended review or overview.

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