

The Coherence of Individual Development: An Evolutionary Perspective on Children's  
Internalization of Parental Values

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## The Coherence of Individual Development: An Evolutionary Perspective on Children's Internalization of Parental Values

The thesis of this chapter is that evolutionary theory can make a major contribution to conceptualizing children's internalization of values. The paper is broadly divided into four sections:

The first section develops an evolutionary framework in which internalization is a facet of high-investment parenting and is expected to co-vary with a number of other life history variables, including age of puberty, developmental plasticity and intelligence. This section stresses the tendency for intercorrelations among a large number of variables related to internalization and other aspects of parental investment—what I term the coherence of development.

The second section discusses adolescent sexual behavior as an example of developmental coherence, stressing its interrelationships with other variables associated with internalization and parental investment. I argue that external cultural supports for adaptive behavior are of less importance for high-investment families than for families that are, for genetic and/or environmental reasons, less inclined toward high-investment parenting. This is because relatively low-investment parents are less able to rely on an internalized motivational system to keep children's behavior "on an adaptive track." Children from relatively low-investment families are less likely to accept cultural choices valued by adults. As a result, external cultural supports for culturally adaptive behavior are of critical importance for children and families toward the low-investment end of the parental investment distribution.

The third section contrasts two theoretical approaches to life history theory. One approach suggests that variation in parental investment patterns and internalization results from "alternate strategies" in which different levels of parental investment are evolved responses to variation in resource availability. The other approach suggests that variation in life history strategies is influenced primarily by genetic variation in viable reproductive strategies. I argue on theoretical and empirical grounds that the latter interpretation provides the most parsimonious fit with the available evidence.

Finally, the fourth section discusses some specific mechanisms related to internalization. Internalization is here conceptualized as resulting from a generalized motivational system that makes children receptive to parental influence independent of specific content. Following a brief discussion of temperament influences, attention is focused on warmth as a central motivational component of the internalization of parental values. Warmth is viewed here as an evolved reward system that motivates family members to bond together by making close relationships pleasurable to their participants. Parent-child warmth therefore channels children's social learning because children are motivated to attend to adult values and seek parental approval.

*Basic ideas.* At the outset, however, it is useful to begin with a few definitions and general ideas. Evolutionists accept as a fundamental postulate that the process of natural selection over the course of evolutionary time has shaped every aspect of the human mind. Humans, like other species, evolved a set of adaptations that functioned to solve particular adaptive problems occurring in the environment of evolutionary adaptedness (EEA). (The EEA is the environment in which humans evolved. The EEA presented the set of problems whose solutions constitute the set of human adaptations.) Thus, for example, Bowlby (1969) proposed that a recurrent problem of our evolutionary past was that human infants were helpless in the face of danger from predators. This problem was solved by the evolution of the human attachment system as a mechanism that reliably results in infants staying close to their mothers.

The general principle that natural selection sculpted the human mind, by itself, tells us little about the structure of the human mind and even less about development. Basic evolutionary logic, however, requires that at least some evolved systems be domain-specific (Cosmides & Tooby, 1987). Domain-specific mechanisms have two important characteristics: they evolved in order to solve a specific recurrent problem in the human EEA; and the mechanisms are content-specific in the sense that they take in only a very delimited set of stimuli and, via a decision rule, produce only a limited set of outcomes which solve a highly discrete adaptive problem (Buss, 1995). Domain-specific psychological adaptations evolved in specific environments and responded to the recurrent properties of that environment. For example, Bowlby (1969, 1973) proposed that infants have natural likes and dislikes, such as a natural liking for contact comfort and a natural dislike for being in strange situations in the absence of an attachment figure. These natural likes and dislikes are adaptive responses to recurrent features of the EEA.

Within this perspective, then, domain-specific mechanisms are construed as species-typical universals that evolved to solve recurrent adaptive problems posed by recurrent features of the environment. However, there is every reason to suppose that domain-general mechanisms are also an important feature of human adaptation. Domain-general mechanisms did not evolve to solve a specific recurrent problem in the human EEA, but rather can be utilized to solve a wide range of non-recurrent problems. Moreover, domain-general devices are able to take in a wide range of stimuli and produce a wide range of responses that could solve these non-recurrent problems.

An important example of a domain-general mechanism central to research on children's internalization of values is social learning. From an adaptationist perspective, social learning is an important adaptation because it facilitates the attainment of evolutionary goals (e.g., acquiring economic resources, obtaining mates, etc.) by allowing individuals to profit from others' experience and knowledge. These evolutionary goals may themselves involve domain-specific mechanisms such as evolved mechanisms underlying sexual attraction or status seeking. However, the nature of these domain-general mechanisms is to be able to attain evolutionary goals in a very flexible

manner. For example, parents who learn the proper use of a tool useful in farming can transmit this information to children, thereby saving the children a prolonged process of discovery and trial and error learning, and ultimately facilitating the evolutionary goal of obtaining food. Learning mechanisms are thus able to solve non-recurrent problems presented by an ever-changing and incredibly complex human environment. Within this perspective, social learning evolved because it permitted organisms to adapt successfully to relatively variable, non-recurrent and unpredictable aspects of the environment (Boyd & Richerson, 1985; Pulliam & Dunford, 1980).

Boyd and Richerson (1985, 1988) show that in general social learning is evolutionarily favored where the problems to be solved are not recurrent features of the EEA and where there are high costs to individual learning. By observing the consequences experienced by others, social learners can avoid the costs of individual trial and error learning. In the case of humans, social learning is therefore likely to be most important for issues that have high potential costs for children. Such issues include career choices, religious affiliation, and behaviors, such as sexual behavior, driving habits, or drug use, that are dangerous or could prevent the attainment of long-term goals favored by parents. In the following I will argue that parent-child warmth functions to channel children's social learning within the family. Moreover, it does so in a manner that tends to result in children making cultural choices related to potentially costly behavior that are more in line with adult values. While the present paper concentrates on the influence of warmth on social learning, an evolutionary perspective on social learning is also compatible with supposing that evolution has shaped children's preferences for other features of models such as dominance, high social status, and similarity (MacDonald, 1988).

## I. INTERNALIZATION AND THE COHERENCE OF INDIVIDUAL DEVELOPMENT

Traditional developmental research as well as some evolutionary perspectives (e.g., Tooby & Cosmides, 1992) tend to compartmentalize humans into various discrete domain-specific and/or domain-general systems. Within this perspective, different discrete systems have different functions, and there would be no reason to suppose a general co-ordination among developmental systems. This is because there is no over-arching goal of development—no over-arching problem that required a coherent developmental response. Instead, there is a large set of unrelated problems that pulled for a set of specialized, unrelated systems.

This does not appear to be the whole story, however, and in the following I will argue that there is also evidence for a substantial coherence of individual development which can ultimately be linked with life history theory. Life history theory attempts to understand variation in the reproductive strategies adopted by different life forms. Life history theory implies developmental coherence because a reproductive strategy involves a coordinated response to the organism's environment resulting from the need to optimally partition mating and parenting effort. The

fundamental dimension of reproductive strategies may be construed as a dimension that ranges from a high-parental-investment/low-mating-effort strategy to a low-parental-investment/high-mating-effort strategy (e.g., Wilson, 1975).

A particular life history strategy of parenting results in a coordinated suite of traits at all stages of the lifespan. This is because a reproductive strategy involves a response to a central external ecological contingency that selects for optimum levels of partitioning mating effort (i.e., the effort expended in attracting mates) and parenting effort (i.e., effort expended in rearing offspring). The result is that variables such as mortality rates, longevity, pair bonding, age of first reproduction, period of pre-adult dependency, and levels of paternal and maternal investment evolve as a coordinated response to the environment. Thus, for example, species adapted to environments where there is a relatively stable, predictable resource base tend to have a suite of traits allowing them to produce highly competitive offspring. Such species would be likely to have traits such as pair bonding between parents, high-investment parenting (including paternal provisioning of the young), low fertility, and delayed maturation of the young.

From the perspective of life history theory, mechanisms of internalization are a central aspect of a coherent pattern of development involving high-investment parenting. In the following I will first review data showing the coherence of development and then review data showing that internalization is a facet of a coherent pattern of development.

*Data Showing the Coherence of Development.* The coherence notion of development is based on the proposal that the parent-child relationship is a co-evolving system in which there is only limited independence of systems. Ultimately, this occurs because of the unifying force of parental investment as a critical focus of natural selection. The result is that there is a great deal of overlap among the variables central to parental investment. For example, increasing brain size is associated with increasing intelligence and increasing levels of parental care across a wide range of species (Lovejoy, 1981; Rushton, 1995; Schultz, 1960). The expectation is that among humans variation in parental investment will co-occur with variation in intelligence as well as with mechanisms such as parental warmth that play a critical motivational role in high-investment parent-child relationships.

Moreover, there is the general expectation that the high-investment end of the parental investment continuum will be characterized by greater developmental plasticity, at least during the period of pre-adult dependence on parents. This follows because developmental plasticity is a necessary condition for the effectiveness of important aspects of the environments provided by parents. Plasticity is a two-edged sword because it opens up the organism to environmental influences that may be detrimental to individual development (Lerner, 1984; MacDonald, 1985). As a result, one expects to find associations among brain size, mental ability, learning ability, flexibility of response, and developmental plasticity. And one expects to find associations among

these variables and the elaboration of costly parenting practices, delayed sexual maturation, and a prolonged juvenile period in which social learning is of great importance. This is indeed the general evolutionary thrust among the mammals, and in particular, among humans (Bonner, 1980; Eisenberg, 1981; Gould, 1977; Jerison, 1973; Johanson & Edey, 1981; Lerner, 1984; Lovejoy, 1981).

Support for these associations is also indicated by findings showing higher levels of parent-child play and generally better developmental outcomes in parent-rearing societies compared to sibling-rearing societies (MacDonald, 1993). Play, parental investment, and plasticity are intimately connected to each other. If there were no plasticity, there would be no reason to engage in play. The decline in play during adulthood is an important prediction of this perspective. Similarly, if there were no plasticity, other aspects of parental involvement, such as the high levels of verbal communication apparent in high-investment parent-child relationships (see below), would be ineffective and therefore result in costs to parents with no corresponding benefits to children.

These associations imply that greater mental ability is a critical co-evolutionary concomitant of plasticity (including social learning) because it minimizes the risk of maladaptive environmental influences while allowing beneficial effects (MacDonald, 1991). Parents with greater mental ability are better able to respond flexibly to adaptive demands. They are more likely to model behavior that is an adaptive response to non-recurrent, non-EEA environments than are individuals with less mental ability. And, at least partly because of the warmth of their relationship with their children, their children are more motivated to attend to them as models and more likely to conform to parental values.

The data reviewed by Belsky, Steinberg and Draper (1991) are highly compatible with this perspective. They especially note the large intercorrelations among spousal harmony, parent-child relationship quality, children's interpersonal style, timing of puberty, sexual behavior, and level of parental investment. As indicated above, behaviors related to parental investment and reproduction are central to life history theory.

The coherence of individual development also appears to involve measures of intelligence. IQ is the single most powerful measure of individual differences psychologists have developed and is related to variation in a very wide range of human activities. While IQ tests are mainly used as a measure of individual differences, it is also relevant to note that, compared to, say, chimpanzees, even humans with a low IQ are able to solve a very wide array of problems that were not recurrent problems in the human EEA. The average human level of *g* therefore may be conceptualized as resulting from a set of species-typical, domain-general mechanism(s) underlying the specifically human advantage in mental ability compared to other species.

Like social learning, human intelligence may be viewed as set of domain-general systems that function to achieve evolutionary goals. For example, research on IQ indicates correlations with

socio-economic status (e.g., Scarr & Weinberg, 1978). If one assumes that social status is an evolved human motive disposition (e.g., Barkow, 1989; Buss, 1994), the implication is that individuals higher on  $g$  are better able to use their domain-general cognitive abilities to achieve an evolved motive disposition (social status) in an environment far removed from the human EEA. For example, individuals with high  $g$  in the contemporary world would score well on standardized tests used to select applicants to prestigious graduate schools. They would be able to solve a very wide array of problems presented in the curriculum of these schools and would excel their colleagues after graduation, with the result that they would achieve higher social status, make more money, and be a more desirable mate (i.e., achieve evolutionary goals). Their higher intelligence implies that their mental ability is not narrowly restricted to the ability to solve highly discrete problems presented by recurrent situations in the human EEA. Rather, their high level of general intelligence would allow them to master the intricacies of a wide range of fields requiring a high level of general intelligence. An individual with a high  $g$  would, all things being equal, be more likely to succeed not only, say, in the legal profession but also in medicine, business, academia, or government.

Within this perspective, natural selection for intelligence as a domain-general attribute would be favored because it enabled humans to attain evolutionary goals. Moreover, variation in IQ is linked to the different patterns of development reviewed by Belsky et al (1991) (see reviews in Herrnstein & Murray [1994]; Rushton [1988, 1995]; Wilson & Herrnstein, 1985; see also below). Besides variables directly related to mental testing, such as school performance, these results indicate associations among IQ, proneness to illegitimacy, child abuse, low birth weight, sexual behavior, divorce (unstable pair bonding), rates of physical maturation, parent-child relationships, poverty, welfare dependency, and crime.

The data may therefore be interpreted as indicating that there is a very important central core of co-varying systems (many of them presumably domain-specific; see below) that includes at least one highly domain-general ability—the  $g$  factor of IQ tests. While the associations among the various systems are not robust enough to preclude a semi-independent role for discrete evolved systems such as the human affectional system, the substantial coherence of individual development strongly suggests the importance of life-history theory in conceptualizing human development. As indicated above, life history approaches to human development focus fundamentally on variation in reproductive strategies (e.g., Belsky et al 1991; Chisholm, 1993; MacDonald, 1994; Miller, 1994a; Rushton, 1988, 1995), and within such perspectives parental investment is the critical variable.

*Environmental and Genetic Aspects of Parental Investment.* Within this perspective, a critical aspect of high levels of parental investment is the provision of optimal environments for children. If we accept the proposition that there was natural selection for high-investment parenting among humans (e.g., Fisher, 1992; Flinn & Low, 1986; Lancaster & Lancaster, 1987; Lovejoy, 1981; MacDonald 1988), then it is reasonable to suppose that one result of this process is that high-

investment parents provide certain types of high-quality environments for their children and that these environments contribute to the child's development. Parental investment clearly involves the provision of certain environments, and parents incur a considerable cost in providing these environments: Parental investment includes developing a strong affective relationship with the child, providing relatively high levels of verbal stimulation and parent-child play, and active parental involvement in monitoring virtually every aspect of the child's life (e.g., children's progress in school, children's peer relationships) (Belsky et al, 1991; MacDonald 1988, 1992, 1993). From a theoretical perspective the best evidence that the environments provided by high-investment parents must have benefits is the very clear evidence that they are costly to provide. Theoretically it is difficult to conceive of a behavior with clear costs remaining in a population without some compensating benefits. For example, if children do not benefit from paternal investment, it is difficult to conceptualize why either males or females would seek such investment. Under these circumstances, males would be better off competing with other males for access to additional females (i.e., increasing their mating effort) than to invest in the offspring of one female (i.e., maintaining high levels of parenting effort). Indeed, minimal parenting effort by males is a common pattern in nature, especially among mammals (e.g., Kleiman, 1977, 1981).

While the foregoing argues for the importance of children's environments, it is not inconsistent with evidence that high-investment parenting is itself genetically influenced. There is evidence for reasonably high heritability of all of the behaviors related to parental investment. Thus measures of parents' and children's perceptions of parental control and especially parental warmth are genetically influenced (Rowe, 1994). Parental stimulation and involvement (including measures of parental warmth and control) as measured by the Home Observation for Measurement of the Environment (HOME) and the Family Environment Scale (FES) also have a considerable genetic component (Plomin, 1994). These measures of parental investment co-vary to a considerable degree with high IQ which is itself substantially heritable (Plomin 1994; see also below). Interestingly, research with the HOME also supports the coherence of development: There is a substantial co-variation among the HOME subscales of emotional and verbal responsiveness, provision of play materials, maternal involvement, and opportunities for variety of stimulation (Bradley & Caldwell, 1984). Parents who provide verbal stimulation and monitor their children closely also tend to have close emotional relationships with them.

The behavioral genetic evidence may be interpreted as indicating that parents and their children are a co-evolving system in which passive genotype-environment correlations are of great importance. (Passive genotype-environment correlations are correlations between children's genotypes and the environments provided to children. For example, there may be correlations between children's genotypes and the environments provided by their biological parents. Intelligent parents have children with a high genetic potential for intelligence and they also provide optimal

environments for the expression of their children's intelligence.) Children would be expected to differentially benefit from the environments provided by high-investment parents depending on their genotype. Thus far the evidence does indeed indicate that, in early childhood at least, passive genotype-environment correlations are more important contributors to the correlations between measures of IQ and the HOME and FES measures of the environment than are active or reactive genotype-environment correlations (Plomin, 1994). (Active genotype-environment correlations occur because the child seeks out environmental niches consistent with his/her genotype; reactive genotype-environment correlations occur because children's genotypes influence the way others respond to them.) The evidence does not show that the environments parents provide are of no importance.

*Internalization and the Coherence of Development.* On the basis of the foregoing, it is expected that the literature on internalization of parental values will have the following characteristics: Variation in the internalization of parental values will be difficult to disentangle from the influences of genetic variation as well as from a large number of other environmental correlates related to adaptive functioning, including socio-economic status, parents' and children's intelligence, parental disciplinary styles, parental warmth, parental monitoring of children's behavior, and encouragement of adaptive behavior, etc. Within this conceptualization, children's internalization of values is viewed as a concomitant of high-investment parenting. Internalization of values is proposed as a critical aspect of high investment parenting that effectively limits the potential costs of the open-ended, domain-general, and highly flexible systems associated in a co-evolutionary complex with high-investment parenting.

There is substantial evidence that the internalization of parental values is deeply embedded within the context of high-investment parenting. The coherence notion is compatible with Lewis's (1981) suggestion that parenting typologies show a large overlap among different measures of parenting with the result that it is difficult to ascertain which aspects of parenting produce which developmental outcomes. Measures of warmth and control are difficult to separate in practice. Measures of parental control may actually tap lack of parent-child conflict (which is influenced by parent-child warmth) or the ability of the children of authoritative parents to change the rules by rational discussion. Such a view is highly compatible with the patterning of differences in parenting styles. For example, lower socio-economic status (SES) parenting is associated with rigidity, power-assertive styles of discipline, lower warmth and affection, and less verbal interaction and less use of complex language in interaction with children (Maccoby, 1980). Given data indicating strong associations among IQ, social class, and occupation in the contemporary world, the general findings strongly support the coherence of development. Moreover, these data indicate that external methods of controlling children (high on power assertion, low on warmth) are more characteristic of the low-investment complex than the high investment complex.

Moreover, Darling and Steinberg (1993) note that global parenting styles are associated with different parenting practices in different domains. For example, authoritative parenting involves a very disparate set of parenting practices that would constitute competent parenting in a correspondingly wide range of specific domains. The coherence of parenting styles occurs therefore despite the fact that very different behaviors occur in different situations. Presumably many of these situation-specific behaviors are the result of domain-general mechanisms responding adaptively to variable, non-recurrent and unpredictable aspects of the environment. More intelligent people are better able to respond to such environments adaptively and flexibly. The literature on internalization of values indicates that authoritative parents (whose children are relatively likely to internalize parental values) are more flexible in their response patterns, while authoritarian parents respond with punitiveness regardless of situation (Grusec & Goodnow, 1994).

The coherence of individual development can be seen by focusing on studies that include a sufficiently wide range of variables. In their pioneering study of children's internalization of values within an evolutionary framework, Stayton et al (1971) found strong correlations among measures of parental acceptance of child, parental sensitivity and responsiveness to the child, children's compliance and internalized control of behavior, and child's IQ. Clarke-Stewart (1973) and Lytton (1980) also found that parent-child warmth is associated with children's cognitive competence.

Steinberg, Lamborn, Dornbusch & Darling (1992) utilized several variables including, authoritative parenting (consisting of independent factors of acceptance/involvement, behavioral supervision and strictness, and autonomy-granting), parental involvement in schooling, and parental encouragement to succeed academically in an effort to predict academic outcomes. Academic outcomes were measured by a *school performance* variable (grade point average, time spent on homework, educational expectations, and academic self-conceptions) and a *school engagement* variable (classroom engagement, school orientation, bonding to teachers, and school misconduct). The correlation between the composite dependent measures was .39 ( $p < .001$ ). Moreover, parental authoritativeness was correlated with parental school involvement ( $r = .46$ ;  $p < .001$ ) and with parental academic encouragement ( $r = .33$ ;  $p < .001$ ), and the latter variables were also intercorrelated ( $r = .39$ ;  $p < .001$ ). All of these variables were positively associated with the dependent measures of academic outcomes, including the *school engagement* variable which presumably reflects the internalization of parental values related to education. Similarly, Steinberg, Elmen & Mounts (1989) found a high level of intercorrelation among grade point average and measures of adolescent perceptions of parental acceptance, psychological autonomy, and adolescent perceptions of their own psychosocial maturity, self-reliance, work orientation, and identity (self-esteem).

This does not, of course, imply that the independence among the measures is trivial. For example, in the Steinberg et al (1992) study, there was a pattern showing a substantial number of significant correlations for the dependent variables with parental involvement and parental

encouragement within each level of parental authoritativeness. The average of these correlations was .066, but correlations ranging from .21 to .28 were found among the top three of the four categories of authoritativeness and school performance over two years. The point here is that the data also reveal a substantial coherence to individual development. And because of the nature of IQ tests, academic performance and all of the parenting variables are inevitably linked with IQ whose heritability is responsibly estimated to be in the range of .4 to .8.

The work of Applegate and his colleagues also supports the fundamental coherence of parenting and child development while at the same time casting doubt on the relationship between parenting and either social class or intelligence. Applegate, Burke, Burlison, Delia and Kline (1985) distinguished between two types of parents. One type engaged in relatively elaborated verbal coding which described highly individuated motivations, intentions, and feelings of the individual actors. The other type engaged in restricted coding associated with socially stereotyped role definitions. The former group also used relatively differentiated, abstract, and complex verbal messages in their disciplinary encounters with children, and they appeared to be more nurturant and aware of children's feelings in their descriptions of comforting behavior. While Applegate et al (1985) do not find a link between these different styles of parenting and verbal intelligence, they did find an association among these styles, mother's education, and social class (see also Bernstein, 1974) which are well-known to be associated with differences in intelligence (Scarr & Weinberg, 1978).

However, in a later study, Applegate et al (1992) found strong linkages between measures of abstractness of communication and nurturance in both parents and children but no linkages with social class, thus failing to replicate their earlier results. While Applegate et al's (1985; 1992) results clearly support the general coherence of the co-evolving parent-child system, the tenuous links with social class and intelligence require replication, especially since a great many studies have indicated associations between lower social class and authoritarian parenting styles characterized by rigidity, power-assertive styles of discipline, lower warmth and affection, and less verbal interaction and less use of complex language in interaction with their children (Maccoby, 1980), as well as data indicating strong associations among IQ, social class, and occupation (Herrnstein, 1973).

Finally, internalization of values as an aspect of the coherence of development is apparent in the ethnographic literature and psychometric data on the Ashkenazi Jews (see MacDonald [1994] for a summary). There is historical evidence that Jews have been relatively quick to adopt a low-fertility/high-investment strategy if such a strategy leads to upward social mobility. Evolutionary perspectives on the demographic transition have emphasized the importance of fertility control and high-investment parenting in achieving upward mobility in response to the altered conditions following industrialization (e.g., Borgerhoff Mulder, 1991). Jews entered the demographic transition considerably earlier than gentiles in the same society (e.g., Goldstein, 1981;

Knodel, 1974). This shift to a higher-investment style of childrearing was accompanied by theoretically expected demographic markers of high-investment parenting, including low rates of infant and adult mortality compared to gentiles even after controlling for SES, as well as lower levels of illegitimacy, premarital conception, and divorce rates (Cohen 1986; Goldstein 1981; Guttentag & Secord, 1981).

There is also evidence that Ashkenazi Jews as a group have a very high average IQ. The average full scale IQ is approximately 117, with large differences between performance and verbal IQ compatible with an average verbal IQ of 125 and a performance IQ in the average range. There is good historical evidence for eugenic pressures as a result of marriage practices which produced in large overlap among intelligence, resource acquisition and reproductive success in traditional Ashkenazi Jewish society. However, in addition to this greater genetic potential for intelligence, Jewish parents provide very high levels of verbal stimulation to their children. There is a preoccupation with elaborate verbalization, much of it directed at children, and this type of verbal stimulation has also been observed in contemporary Ashkenazi Jewish populations (Blau, 1969; Herz & Rosen, 1982; Zborowski & Herzog, 1952).

Further, there is a very strong emphasis on developing an intensely affectionate mother-child relationship in early childhood. Mothers have an “unremitting solicitude” (Zborowski & Herzog, 1952; p. 193; see also Blau, 1969) regarding their children. They engage in “boundless suffering and sacrifice. Parents ‘kill themselves’ for the sake of their children” (p. 294). The children were “reminded constantly of all their parents have done and suffered in their behalf.”

As will be elaborated in the final section, the result is an intense motivation to please parents. “All the sacrifice, all the suffering, all the solicitude pile up into a monument to parental love, the dimensions of which define the vastness of filial indebtedness” (Zborowski & Herzog, 1952; p. 297). Children are treated with a great deal of indulgence and permissiveness and there are elaborate methods of inductive reasoning used in an effort to modify children’s behavior (Blau, 1969). There is also very powerful internalized motivation to conform to extremely high parental expectations. Jewish children are expected to provide their parents with *naches* (i.e., desired rewards) in the form of achievement, financial success, and grandchildren, and the failure to provide them causes guilt. “Of course, there can never be enough *naches*, and their failure to provide ‘enough’ inevitably results in guilt” (Herz & Rosen 1982, 380). Blau (1969; p. 60, 61) mentions “the profound fear of the guilt that denial of [the mother] would engender. . . . It was the discomfort—*anxiety and guilt*—that parental disapproval induced rather than fear of coercion that led Jewish children at a relatively tender age to internalize those norms of behavior which are of paramount importance to Jews.”

## II. ADOLESCENT SEXUAL BEHAVIOR: THE IMPORTANCE OF INTERNALIZATION OF PARENTAL VALUES AND INTERACTIONS WITH CULTURAL SHIFTS

Internalization of values as an aspect of the coherence of development is also apparent in the literature on adolescent sexual behavior. Sexual behavior is particularly interesting here because reproductive behavior is central to an evolutionary approach and it raises issues of children's compliance with parental interests. In evolutionary perspective, sexual behavior is a very costly behavior for females because of the possibility of pregnancy. In the parenting literature (e.g., Miller & Moore, 1990), it is assumed that children's physical maturation outpaces their cognitive and emotional maturation. Adolescents are relatively prone to risk taking behavior (including behavior related to low-investment sexual relationships) accompanied by cognitive distortions of invulnerability and infallibility (Arnett, 1995). This results in adolescents being prone to making maladaptive reproductive decisions. This gap between adolescents' physical maturation and their ability to make adaptive choices results in parental attempts to control adolescent sexual behavior. In the same way that due to their cognitive immaturity, very young children benefit from adult guidance and control, adolescent tendencies toward risk taking and cognitive distortions suggest that adolescents continue to benefit from parental influence. And parents, because of their greater mental ability and experience, are better able than children to make adaptive cultural choices for their children.

*External Controls as the Norm for Adolescent Sexual Behavior.* Parental attempts to control the sexual behavior of their relatives, particularly their daughters, occur in a wide range of societies (Flinn & Low, 1986). Often the methods used involve coercion, an externalized form of motivation. Marriage arrangements are typically agreements between men involving exchanges of women. Adolescents (or even infants and unborn children) are often betrothed to men in exchange for reciprocal access to females controlled by the men. In addition, many societies practice seclusion or claustration of young women prior to marriage in order to assure that the women's reproductive assets are not squandered on an inappropriate relationship (Dickemann, 1981). Flinn (1988) finds that Caribbean villagers controlled daughter's sexual behavior between the ages of 11-20 by physical violence and verbal threats directed at daughter or suitor, restricting daughter's movements, surveillance, and economic sanctions. Successful "guarding" behavior was related to daughter's eventual marriage with a more prosperous male (who, as expected within an evolutionary framework [Buss, 1994] tend to prefer chaste females) and to more stable marriages among these daughters.

The cross-cultural data then suggest that heavy-handed, extrinsic methods of control are commonly used to control daughters' sexual behavior, while there is little evidence for the importance of internalization of values as an important mechanism. Because of the widespread

nature of these practices and because of the critical adaptive importance of controlling daughter's reproductive assets, it is reasonable to suppose that externalized mechanisms of control were a recurrent practice during human evolution.

*The Importance of Internalization in Contemporary Western Societies.* There is evidence from the contemporary United States and other Westernized countries suggesting that authoritative parenting, parental warmth, and the internalization of values are related to adolescent girls' sexual behavior. Contemporary individualistic Western societies place a relatively strong emphasis on personal freedom and there has been a corresponding decrease in parents' ability to exert extrinsic controls on their children as they approach adulthood. At a broader level, the relative lack of control over children's sexual behavior typical of contemporary societies is very likely to be a departure from practices prevalent in the EEA. In this radically different context, internalized mechanisms of control assume much greater importance. As indicated above, a basic feature of the present framework is that parent-child warmth is an internalized motivational system that serves to motivate adaptive behavior in non-EEA environments.

Data on children's sexual attitudes and behavior from contemporary Western societies illustrate are highly compatible with supposing that internalization of parental values is of considerable importance. These data also show that sexual behavior is a component of a coherent pattern of individual development. For example, Jessor and Jessor's (1977) problem-behavior theory posits a general association among a wide range of behaviors and attitudes. Consistent associations have been found among high valuation of independence, low valuation and expectations of academic achievement, social alienation, more tolerant attitude toward deviance, lesser religiosity, fewer parental controls, less compatibility between expectations of friends and parents, and greater influence of friends relative to parents. Adolescents with this intercorrelated constellation of behaviors do more poorly at school and are more likely to have a variety of problem behaviors, including earlier age of first sexual intercourse and greater likelihood of alcohol or drug use. They also have lower educational and occupational outcomes in later life.

This implies that sexual experience is regulated by a co-varying "network of personality, social, and behavioral factors. . . . The pervasiveness of these variables across the different systems of problem behavior theory suggests that there is a general psychosocial patterning of proneness to, or readiness for, transition rather than proneness being confined to only one or two variables or to one or another system or only to those variables that are specifically sex related" (Jessor et al 1983, p. 623; see also Tubman et al, 1996). As Belsky et al (1991, p. 660) note in commenting on this program of research, "in a society that no longer labels nonmarital sexual activity as 'deviant,' one must ask why this behavior co-varies with such censured behaviors as delinquency and substance abuse." Notice particularly the lack of consistency between parent and child expectations and greater peer influence in the early-prone group—a clear indication that these children have not

internalized parental values. Moreover, it is apparent from other research (e.g., Murstein & Holden, 1979) that another aspect of this co-varying constellation is affective closeness to parents.

*Interaction between Parental Investment and Cultural Supports for High Investment Parenting.* A prediction of the coherence perspective is that cultural supports for children's behavior will be most important at the low-investment end of the parental investment distribution. This is because the children of high-investment parents are internally motivated to accept parental values and to attend to parents as models of appropriate behavior. Moreover, independent of parental influences, they are likely to be more prone to adopt a high-investment pattern of behavior because of their genetic proclivities even in the absence of parental influences. Children on the low-investment end of the distribution, on the other hand, are expected to be relatively little motivated to accept adult values (low internalization). And, independent of internalizing parental influences, children on the low-investment end are expected to be more prone to cultural choices involving immediate gratification and low-investment sexual relationships, as well as more prone to choosing cultural influences, including peers, disapproved by adults.

Cultural supports for high-investment parenting act as external forces of social control which act to maximize high-investment parenting among all segments of the population, even those who are relatively disinclined for genetic and/or environmental reasons to engage in such practices. One may view cultural supports for high-investment parenting as a form of external social control that is formally analogous to externalizing methods of parental discipline.

In the contemporary world, systems of parental socialization of children must compete with other influences. Especially important are the peer world, the media, and other influences emanating from the wider culture whose values often conflict with parental views on appropriate sexual behavior. There are also secular trends in external influences, especially in the media and the wider culture, that impact on the parent-child system. In some historical eras, there has been more congruence between the wider culture and parental values than at others. As a result it is reasonable to suppose that children's internalization of parental values occurs more easily at some historical periods than at others.

The historical data on marriage in Western societies indicate that traditionally there have been very low levels of divorce and illegitimacy, even during periods of relative economic hardship (MacDonald, 1995a). The prototypical response to environmental adversity has been to delay reproduction and there has been a consistently low level of illegitimacy during periods of economic decline as well as periods of economic prosperity (see also below). Moreover, there is excellent evidence that this pattern was maintained by powerful social controls embedded in the religious and legal framework of Western societies. For example, during the medieval period the Church successfully opposed divorce, concubinage, and illegitimate birth for all classes of society,

including the wealthy. And in later periods women and lower and middle status males were important interest groups that maintained these cultural supports for high-investment parenting.

However, since approximately 1965 there has been a massive cultural shift away from these traditional patterns toward a dramatically increasing prevalence of a low-investment reproductive style in the United States and other Western societies. The interesting point from the present perspective is that there has been a powerful interaction between this cultural shift and individual tendencies toward high-investment parenting.

Since 1970 the rate of single parenting has increased from 1/10 families to 1/3 families (Norton & Miller, 1992), and there have been dramatic increases in teenage sexual activity and teenage childbearing without marriage (Furstenberg, 1991). There is excellent evidence for an association among teenage single parenting, poverty, lack of education, and poor developmental outcomes for children (e.g., Dornbusch & Gray, 1988; Furstenberg & Brooks-Gunn, 1989; McLanahan & Booth, 1989; Wilson 1993b).

Indeed, all of the negative trends related to the family show very large increases which developed in the mid-1960's (Herrnstein & Murray 1994, 168ff), including increases in trends toward lower levels of marriage, "cataclysmic" increases in divorce rates (p. 172), and rates of illegitimacy. In the case of divorce and illegitimacy rates, the data indicate an enormous shift upward during the 1960's from previously existing trends, with the trend lines established during that period continuing into the present. Clearly the 1960's was a watershed period in American social and cultural history.

Whatever the cause of these secular trends, Herrnstein and Murray (1994) show that these changes in social functioning have not fallen evenly across the continuum of parental investment. For example, only 2% of the white women in Herrnstein and Murray's top category of cognitive ability (IQ minimum of 125) and 4% of the white women in the second category of cognitive ability (IQ between 110 and 125) gave birth to illegitimate children, while the corresponding rates for the bottom two categories of cognitive ability are 17% (IQ between 75 and 90) and 32% (IQ below 75) respectively. Moreover, in the period from 1960 to 1991, illegitimacy among Blacks rose from 24% to 68%, while illegitimacy among whites rose from 2% to 18%. Thus the cultural shift in which the traditional social controls characteristic of historical Western societies have been severely attenuated has had little effect on individuals predisposed toward high-investment parenting. However, the attenuation of these controls has resulted in a massive alteration of behavior among individuals who are not so inclined.

There is evidence that an important contributor to this cultural shift in reproductive behavior is low paternal investment in children. Marriage, far more than mother's IQ, is the most important variable in predicting poverty among children and its correlative negative developmental outcomes (Herrnstein & Murray, 1994, 138). Moreover, the adolescent girls who are most likely to become

pregnant are least under the control or influence of adults, especially fathers. For example, Herrnstein & Murray (1994) found that father-absence at age 14 was a strong predictor that the woman's first birth would be illegitimate. Given the general association between precocious adolescent sexual behavior and a variety of deviant behaviors (see above), it is relevant that Dornbusch et al (1985) found that single parenting is associated with lower levels of parental control of adolescents and higher levels of deviant behavior by adolescents.

These results imply that culturally transmitted information has a major role in child development, but that the effects of cultural transmission interact with individual tendencies toward parental investment which are in turn influenced by individual differences in life history strategy.

The data reviewed in this section indicate the importance of considering complex processes of social control and their interaction with individual differences in life history strategies in attempting to understand historical processes that influence child development. At a theoretical level, social controls on reproductive behavior may be viewed as influenced by evolved motivational systems and conflicts of interest over the construction of culture. Nevertheless these social controls are underdetermined with respect to evolutionary theory, human nature/nurture (i.e., the characteristics of humans), or external ecological variables (MacDonald, 1995a). And while understanding the origins of important cultural shifts, such as those occurring during the 1960's, clearly takes one a long way from developmental psychology, the conclusion must be that child development occurs in a highly embedded, socially constructed cultural context.

### III. THEORETICAL PERSPECTIVES ON THE COHERENCE OF INDIVIDUAL DEVELOPMENT

The data reviewed above indicate a substantial coherence to individual development. Internalization is a critical component of a coherent pattern of high-investment parenting, and in the following I will describe two different approaches to conceptualizing variation in parental investment in the contemporary world, an approach in which variation in parental investment results from environmental cues interacting with universal human psychological mechanisms and an approach in which variation in parental investment patterns results primarily from heritable variation.

Belsky et al (1991; see also Chisholm, 1993) argue that the differing patterns of coherent development result from a universal psychological mechanism that results in different reproductive strategies as a response to the presence or absence of environmental stress and high or low resource availability. They propose an "alternate strategy" perspective in which a low-investment reproductive strategy results as an adaptive response to environmental stress. Low resource availability leads to spousal disharmony and insensitive, unresponsive parenting styles. This in turn

leads to insecure attachment and an opportunistic interpersonal style among children. Children adopting this strategy enter puberty at an earlier age and they are sexually precocious compared to children in a resource abundant environment. As adults, they are prone to unstable pair bonds.

While Belsky et al (1991) argue for this alternate strategy perspective, they also note that additive genetic variation (i.e., heritability) may influence these patterns. Indeed, Moffitt, Caspi, Belsky, & Silva (1992), while replicating the findings of an association between childhood stress and pubertal timing, suggest that a genetic model provides a more parsimonious fit for the data. Supporting a genetic interpretation, pubertal timing was associated with mother's age of menarche and there was no support for the idea that early puberty was mediated by childhood behavior problems. On the other hand, Graber, Brooks-Gunn and Warren (1995) found that depressive affect (but not internalizing or externalizing behavior) added to the variance explained by mother's age of menarche. However, the influence of depressive affect was greatly attenuated by the addition of breast development or weight to the model. In any case, neither of these studies can test between a heritability model and a contextual model of pubertal timing: Mother's age of menarche is a fairly crude index of genetic influences on daughter's age of menarche.

In the following I will argue that a theory that emphasizes the importance of heritable variation for understanding patterns of high- and low-investment reproductive strategies. There is indeed evidence that variables related to reproductive strategies are heritable. Pubertal timing is substantially heritable (Fischbein, 1977; Tanner, 1990), and there are moderate heritabilities for age of first sexual intercourse (Martin, Eaves, & Eysenck, 1977), warmth/nurturance and impulsivity/extraversion as personality traits (i.e., Factors I and II of the FFM) (e.g., Digman, 1990), parental warmth toward children (Rowe, 1994), parenting styles (Plomin, McClearn, Pedersen, Nesselroade, & Bergeman, 1989), and likelihood of divorce (Rowe, 1994). Also, the reproductive strategy perspective developed here includes intelligence as a critical, highly heritable variable.

*Conceptualizing Human Reproductive Strategies: Adversity Selection and r/K Reproductive Strategies.* The basic assumption of the alternate strategy perspective is that the presence of either short-term or long-term environmental stressors would have the general effect of promoting a low-investment reproductive style. There are reasons to question this assumption. Theoretically, high-investment parenting is associated with adaptation to ecologically adverse or highly competitive environments where high levels of parental investment are critical to rearing successful offspring (Diamond, 1986; Kleiman, 1977, 1981; Miller, 1994b; Wilson, 1975; Southwood, 1981). This makes intuitive sense because in ecologically adverse or highly competitive situations, male provisioning of food or other resources might tip the balance in favor of offspring compared to the offspring of males who do not provision their young. Indeed, several theorists have proposed that the adverse environment created by the Ice Age had an important role in shaping the intelligence

and high-investment reproductive behavior of northern populations (Lenz, 1931; Lynn, 1987; MacDonald, 1994; Miller, 1994a,b; Rushton, 1988, 1995). Within this framework, natural selection resulted in a uniform tendency toward high-investment parenting as a result of long-term resource scarcity: Males who did not provision their young left few descendants. This is quite different from the alternate strategy perspective. Moreover, contrary to the alternate strategy perspective, long term selection in resource-scarce environments is likely to lead to high investment parenting, not low-investment parenting.

In addition to adverse environments, highly competitive environments may also lead to high-investment parenting. Here the theoretical focus has been on the r/K continuum of reproductive strategies. r-selected species evolve in response to highly unstable environments where there is little predictability of resource availability. These species adopt a low-investment/high-fertility reproductive strategy to take advantage of temporary situations where there are abundant resources and little competition. The low investment of relatively r-selected species is not a response to a temporary lack of resources, but rather a response to a highly unpredictable resource environment in which there is selection for very rapid reproduction with little parental effort during the relatively short-lived periods of resource abundance.

On the other hand, K-selected species evolve in response to a highly stable, predictable resource environment. These species adopt a high-investment/low fertility strategy in order to compete with conspecifics (i.e., members of the same species) and with other species (Southwood, 1981). While r-selected species respond to temporary periods of resource abundance with a low-investment reproductive style, K-selected species adapt to a highly predictable resource environment in which parents are forced to forego additional matings in order to invest their time and energy in producing highly competitive offspring.

Within the r/K framework, then, low investment parenting is not a response to resource scarcity, but rather a response to unpredictable short-term resource abundance. Moreover, while r-selected species tend to overshoot their resource base, adversity-selected and K-selected species remain within the carrying capacity of the environment. The expected response, therefore, of a K-selected or adversity-selected species to resource scarcity would be to delay reproduction until reproduction was viable, but not to respond to adversity with low-investment reproduction (see also Miller, 1994b). The expectation would be that cues to environmental adversity would result in a delay of maturation and reproductive viability, rather than an acceleration as predicted by the theory of Belsky et al.

To summarize this section, both competition and environmental adversity tend to result in animals having fewer and more widely spaced offspring, prolonged parental care, longer life span, and lower mortality rates at all stages of the life span. Conversely low-investment parenting is associated with environments rich in resources and with little competition. In the natural world,

resource-rich, competition-free environments are typically ephemeral because a stable resource-rich environment will ultimately lead to intense competition and K-selection.

*Genetic Variation and Environmental Influences on Human Reproductive Strategies.* In the following I will argue that the available evidence is most compatible with supposing that selection for competitive ability (K-selection) and/or an adversity-selected pattern of parental investment is a universal feature of human evolution. Within this perspective, individual differences in parental investment patterns result largely from heritable variation remaining in the population because natural selection did not remove all of the genetic variation related to parental investment. This perspective implies that genetic variation continues to underlie a range of more or less viable strategies within contemporary populations, as is also the case with personality variation (MacDonald, 1995b) and intelligence. (There may also, of course, be continuing natural selection in favor of high- or low-investment parenting in present-day societies.) And, in addition to within-group genetic variation, there may also be between-group differences resulting from different selection pressures affecting groups that evolved in somewhat different ancestral environments (e.g., northern versus southern populations).

First, there is a very consistent pattern indicating that stressors of all kinds uniformly result in a lowered tempo of maturation, including age of menarche, but this pattern is superimposed on a pattern of heritable variation for all measures related to physical growth and development (Tanner, 1990). Some of the more interesting data gathered by Tanner (unless otherwise referenced) include the following:

- Malnutrition (e.g., in times of war) or disease slows down physical maturation. Psychosocial stressors (e.g., abusive family relationships, sadistic teachers) have similar effects on physical maturation as do nutritional deficits or deficits due to disease, i.e., a slowing of developmental tempo. Consistent with these findings, Flinn and colleagues (Flinn & England, 1995; Flinn et al, 1996) show that stressful life events, including family quarreling, living with non-relatives, residence change, divorce, and death of a family member, are associated with infectious diseases and other health problems.
- When controlled for environmental variables, rates of physical maturation reflect ancestral environments rather than current environments (see also Rushton, 1995). This finding emphasizes the importance of heritable variation in physical maturation.
- In Britain, upper SES children continue to mature more rapidly than lower SES children. Additional children of manual workers show more of a growth decrement in comparison to their older siblings than children of non-manual workers. These findings are compatible with the proposal that the greater nutritional and psychological stresses occurring in the lower classes delay maturation.

- Social class differences in growth rates have been obliterated in Sweden and Norway, a result that Tanner suggests is due to the success of social welfare programs in those countries.
- There is a pronounced secular trend (beginning at least 150 years ago in England) of lowered age of menarche associated with better nutrition co-incident with modernization. It is unlikely that these changes are the result of increasing stress in the modern world, since this rise is associated with increases in the birth weights of babies (e.g., Gruenwald et al, 1967) and increases in brain size (e.g., Miller & Corsellis, 1977), and increases in height (Tanner, 1990). More likely, the changes are the result of better nutrition consequent to increasing living standards. Real standards of living have approximately doubled between the 1930's and the 1980's (Coleman & Salt, 1992). Indeed, Flinn and England (1995) summarize data indicating that chronic stress is associated with immune deficiency, inhibited growth, and delayed sexual maturity.
- The stress of high levels of physical exercise, as among dancers and athletes, is known to delay the onset of puberty (Calabrese, Kirkendall, Floyd, Rapoport, Williams, Weiker, & Bergfeld, 1983; Warren, Brooks-Gunn, Fox, Lancelot, Newman, & Hamilton, 1991; Warren, Brooks-Gunn, Hamilton, Hamilton, & Warren, 1986).
- Zajonc's (1976; see also Zajonc, Markus, & Markus, 1979) confluence model indicates that intelligence declines as a function of birth order and less spacing between births.

These findings suggest that the coherence of individual development implicated in the review of Belsky et al derives mainly from heritable variation. Psychosocial and physical stressors actually appear to work in a manner contrary to the theory of Belsky et al. These stressors uniformly delay physical growth and development and result in less robust developmental outcomes as expected on the hypothesis that humans are a relatively K-selected and/or adversity-selected species. On the basis of the data provided by Tanner and others, stressful conditions actually appear to result in delayed maturation, not earlier maturation.

Also supporting the present perspective are historical examples where populations have responded to environmental adversity by delaying reproduction and/or continuing a high-investment style of reproduction. The Great Depression and the depression of the 1890's were associated with later marriage, delays in having children, and markedly lower levels of fertility. On the other hand, the prosperity during and after World War II resulted in a decline in age of marriage and earlier child bearing (Coleman, 1990; Moss, 1964). This pattern is typical of Western societies over historical time (Hajnal 1965; 1983; Laslett 1983; MacFarlane 1980, 1986; Wall 1983; Wrigley and Schofield, 1981). The prime mechanism for the regulation of population in pre-industrial Western Europe centered around a flexible age of marriage, pre-conjugal chastity, and varying the percentage of females marrying. In times of resource scarcity, the age at marriage, especially for males, increased, while in economically expansive times, the age of marriage was lowered. For

example, Wrigley and Schofield (1983) find that at the end of the 17th century approximately 23% of individuals of both sexes remained unmarried between ages 40-44, but that, as a result of altered economic opportunities, this percentage dropped at the beginning of the 18th century to 9%, and there was a corresponding decline in age of marriage. The illegitimacy rate throughout the pre-modern period was usually far less than 3% until after 1750 (Laslett, 1977) and there was no tendency for the rate to increase during times of resource scarcity.

Elder's (1974) data on children experiencing the Great Depression during adolescence are particularly interesting. Consonant with the general tenor of the theory of Belsky et al (see also Conger, Conger, Elder, Lorenz, Simons, & Whitbeck, 1992), economic hardship and status loss during the Depression resulted in strained interpersonal relationships and emotional distance from the parents. The deprived group from middle-class backgrounds tended to marry earlier (i.e., before age 20) than the non-deprived group. (There was no effect of deprivation on age of marriage among the working class women. These women tended to marry relatively early in any case.) Deprived women from middle-class backgrounds who married relatively young tended to have emotionally distant relationships with parents (especially the father), and they were characterized by earlier dating and heterosexual experience.

Nevertheless, women with deprived backgrounds had no more children and actually gave birth to their first child 8 months *later* on average than non-deprived women. Their marriages were no less stable than those of the non-deprived group and their husbands had higher levels of education, income, and social status than those of the non-deprived women. Both women and men from deprived backgrounds were more highly committed to family life and parenthood and to secure interpersonal relationships than non-deprived subjects.

It would appear then that the relatively precocious dating and sexual activity found among the deprived women was not in the service of low-investment reproductive relationships, but rather in the service of attaining economic stability and a high-investment reproductive style characterized by high levels of commitment to family and to rearing children. Indeed, the general picture one gets is that economic insecurity and status loss resulted in a highly conservative strategy for both sexes combined with an intense desire for upward social mobility: "*Signs of family change among the offspring of deprived families are consistently in a conservative direction, toward traditional values and relationships*" (Elder, 1974; p. 286; italics in text). In addition to the data indicating a strong orientation toward family concerns, parental responsibility, and domesticity, deprived males valued economic security and were highly risk-averse in their economic decisions.

Deprived individuals were more likely to be upwardly mobile in later life than were non-deprived individuals. Interestingly, there was a stronger relationship between the physical attractiveness of the woman and status of husband among the deprived women, suggesting that these women were particularly interested in upward social mobility and were better able to

capitalize on their reproductive assets to do so. In addition, boys from families who lost most from the depression scored higher on desiring status and power in social relationships, and in later life boys from deprived, formerly middle-class families achieved somewhat higher social status than the middle-class non-deprived group.

The suggestion is that the long-term effect of economic deprivation in this Caucasian sample was to intensify the motivation for upward social mobility and responsible, high-investment parenting. These general findings and the fact that these results were strongest in those with a middle-class background are highly compatible with the present perspective. If one supposes that, compared to the lower-class group, the middle-class group was more prone to developing a high-investment style of parenting for genetic reasons, then their response to economic adversity is understandable: When confronted with economic hardship and status loss they did not switch to a low-investment reproductive strategy (as proposed by the alternate strategy idea), but increased their striving for upward social mobility and increased their involvement in family and children.

Elder's data therefore do not support the proposal that poverty or downward social mobility causes low-investment parenting, and especially so in formerly middle-class samples. In addition, the Depression resulted in markedly lower fertility and a dramatically lower rate of marriage in general (*Statistical Abstract of the United States [SAUS]*, 1992; Table 127). This finding is consistent with the historic patterns of marriage in Western societies mentioned above: Economic hardship results in postponing marriage rather than adopting a low-investment reproductive style. It is also noteworthy that this trend toward delaying marriage was not accompanied by a rise in the rate of illegitimacy (a marker of low-investment parenting) (Herrnstein & Murray, 1994; p. 178). Rather, the revolution in illegitimacy began in the 1960's, at a time when levels of poverty were at an historic low (Ross, Danziger, & Smolensky, 1987).

Similarly, the rate of divorce actually decreased in the early 1930's and only began its long-term steep rise in the affluent 1960's (*SAUS*, 1992, Table 127). Divorce may be viewed as an index of unstable pair bonding which is often associated with single-parenting and higher levels of poverty among children. (There was also a temporary peak in divorce rate in the period immediately after World War II, during a period of relative prosperity compared to the years of the Great Depression. However, this temporary rise presumably resulted from ill-advised marriages occurring under wartime conditions.)

One might argue that it is not poverty experienced during adolescence that causes low-investment parenting, but rather poverty occurring during the period when affectional relationships are established within the family. Children, such as Elder's subjects, who were exposed to poverty during adolescence may have established close personal relationships (secure attachments) during early childhood. These secure attachments then predisposed them to pair

bonding and high-investment parenting as adults. As a result, these individuals readily adopted a high-investment style of parenting when they achieved reproductive maturity.

The problem with such a perspective is that it would predict that children born during the late 1920's and early 1930's would be prone to low-investment parenting because they had been reared during an era of economic dislocation which resulted in distant, acrimonious parent-child relationships during early childhood. However, as indicated above, the revolutionary increases in the trends toward illegitimacy and divorce began only in the mid-1960's when childbearing in this cohort was largely finished. The revolution in illegitimacy occurred primarily to cohorts born after 1950, during a period of economic prosperity which lasted (as indexed by lowering rates of poverty) until 1970.

Finally, the argument that poverty causes illegitimacy fails to consider the very powerful status of IQ as a predictor of illegitimacy for white women living below the poverty level (Herrnstein & Murray, 1994; p. 188). Rather than finding that low-investment parenting is a uniform response to poverty, low-investment parenting therefore appears to be strongly influenced by the highly heritable trait of intelligence which, as we have seen, is the centerpiece of a high-investment parenting strategy. IQ also predicts scores on the HOME instrument independent of SES, and IQ predicts poverty and welfare dependency independent of parental SES. Again, the suggestion is that variation in parental investment co-occurs with relative resource scarcity, but there is no reason to suppose that the latter causes the former.

To conclude: The most promising life history perspective on development attributes the coherence of individual development to heritable variation in parental investment patterns as modified by environmental influences. Chief among the environmental influences are psychosocial and nutritional stressors which have the uniform effect of delaying and/or stunting physical, intellectual, and reproductive development. From this perspective, there has been a trend toward the co-evolution of parents and children. On the high-investment end of the distribution, children are more prone to internalizing parental values and internalization serves as a potent mechanism of cultural transmission. There is more warmth in parent-child relationships and higher levels of verbal stimulation of children in these high-investment families. There are also relatively powerful tendencies toward stable pair bonding, sexual restraint, and high intelligence.

#### IV. SPECIFIC MECHANISMS: WARMTH AS A MOTIVATIONAL SYSTEM UNDERLYING CHILDREN'S INTERNALIZATION OF VALUES

Research on internalization has focused on two types of mechanisms, one involving the temperament/personality trait of inhibitory control, and the other involving another personality system, that of warmth. While I will concentrate on the latter mechanism, the temperament trait of inhibitory control is also important. Kochanska et al (1996) have shown that this temperament trait

is related to children's internalization as indicated by maternal reports of children's daily behavior and by their greater compliance with mother's and experimenter's rules in situations where they believed they were unsupervised. Inhibitory control appears to involve mechanisms in the prefrontal cortex underlying focusing attention, planning orderly sequences of behavior, inhibiting immediate but inappropriate response tendencies, delaying gratification, persevering in tasks that take a great deal of effort, and planning for the future (Luria, 1980; Mesulam (1986; Rothbart, Derryberry, & Posner, 1994; Tucker & Derryberry, 1992). This system, whose adaptive functions are perhaps obvious, has been linked to the Conscientiousness dimension of the Five Factor Model of personality (MacDonald, 1995).

There is every reason to suppose, however, that parent-child socialization contingencies involving parent-child warmth are also important for internalization. Evolutionary accounts of children's compliance and internalization of values have emphasized these processes as natural consequences of children's relationships of attachment and affection with their parents (Stayton, Hogan, & Ainsworth, 1971). The human affectional system (warmth) may be viewed as a system that evolved to underlie intimate family relationships (including spousal relationships and parent-child relationships). The proposed function of this system is to facilitate parental, including paternal, investment in children (Fisher, 1992; MacDonald 1988, 1992). And, as emphasized in this paper, warmth also functions as a mechanism for the transmission of cultural values from parents to children (MacDonald 1988, 1992). As expected on the view that there is considerable coherence to development, Eysenck's psychoticism superfactor of personality theory includes items related to warmth and affection as well as items related to conscientiousness (see Eysenck & Eysenck, 1976). This indicates that the two personality/temperament systems emphasized here as underlying children's internalization of values share common variance.

*An Evolutionary Perspective on the Human Affectional System.* The human affectional system is of central importance here because of its proposed role as underlying children's internalization of values. As is the case with other evolved appetitive motivational systems (Wilson, 1975), the human affectional system may be conceptualized as a reward system (see Hatfield & Rapson, 1994; Kohl & Francoeur, 1995; Liebowitz, 1983). The stimuli that activate this system act as natural eliciting cues for pleasurable affective response, just as the stimulus of sugar water naturally leads to pleasure in an infant. The stimuli that activate the human affectional system are thus "natural clues" in Bowlby's (1969) sense. Intimate relationships are therefore naturally pleasurable to the participants and are actively sought after. Their termination is met with disappointment and grief, while there is eager anticipation of reunion with a loved one.

At a basic level, warmth is one of several personality systems understood as normative, species-typical adaptations that functioned to produce adaptive behavior in the human EEA. Within this perspective, individual differences in attraction to the rewards of intimacy and affection are

viewed as a personality dimension—Factor II of the Five-Factor Model (FFM). Digman (1990) notes that such a dimension has been consistently found in factor analytic studies of personality performed over the last 50 years. He characterizes the dimension as involving “the more humane aspects of humanity—characteristics such as altruism, nurturance, caring, and emotional support at the one end of the dimension, and hostility, indifference to others, self-centeredness, spitefulness, and jealousy at the other” (pp. 422, 424). (See also descriptions of reward dependence [Sigvardsson, Bohman, & Cloninger, 1987], psychoticism [reversed] [Eysenck & Eysenck, 1976], and agreeableness [John, 1990]). In addition, the well-studied circumplex model of interpersonal descriptors results in a dimension of Nurturance/Love (Kiesler, 1983; Trapnell & Wiggins, 1990; Wiggins, Trapnell, & Philipps, 1988). Here this dimension of personality is proposed to underlie adaptive relationships of intimacy and other long term relationships, especially family relationships. These relationships involve reciprocity between spouses and transfer of resources to children (e.g., maternal and paternal investment in children).

The reward-system idea implies that the affectional system is above all a motivational system. Moreover, it is a system based predominantly on positive, appetitive motivation. The child who is high on the affectional system finds the stimuli characteristic of intimate, affectionate relationships to be highly rewarding. Such a child eagerly seeks out relationships, including peer relationships of friendship, in which this stimulation is available. Because the other person in such a relationship also finds this stimulation rewarding, the relationship is characterized by reciprocal positive affective exchanges. Friends are “intimate associates” and their relationships are characterized by reciprocity, commitment, cooperation and engaging in reciprocated prosocial support, intimacy and affection (Hartup, 1989).

*Warmth and children’s internalization of values.* A continuing relationship of warmth and affection between parents and children is expected to result in the acceptance of adult values by the child, identifying with the parent, and a generally higher level of compliance—“the time-honored concept of warmth and identification” (Maccoby & Martin, 1983, p. 72). The finding that warmth of the model facilitates imitation and identification has long been noted by social learning theorists (Bandura, 1969; Mischel, 1976). From the present theoretical perspective this is expected because the behavior of the child is part of a relationship characterized by reciprocated positive interactions. Moreover, the parent’s evaluation of the child’s behavior is an aspect of this reciprocated positive interchange. Children in a warm parent-child relationship are expected to be positively motivated to seek the approval of their parents and to identify with their parents.

However, parents would be expected to respond negatively to children’s failure to live up to parental values and standards of appropriate behavior. It would therefore be a dissonant element in a continued relationship based on reciprocated positive interaction. For a child who had developed a very powerful relationship with the parent based on warmth and affection, children’s behavior that

contravenes parental standards of appropriate behavior is expected to result in guilt and anxiety. Thus the affective motivational component of internalization includes both negative emotions aroused at the threat of parental disapproval of child's behavior as well as the positive emotion of warmth that results in attraction to and identification with parents. As with other evolved motivational systems underlying personality, both positive emotions and negative emotions are associated with the same system (MacDonald, 1995b). For example, the behavioral avoidance system responds with fear and anxiety to perceived threats and dangers, but there is intense relief upon the attainment of safety.

In conformity with these expectations, there is good evidence that parental warmth is associated with internalization of parental values (Grusec & Goodnow, 1994). Parental warmth is also associated with the development of conscience and an internalized moral orientation (Brody & Shaffer, 1982; Hoffman, 1970; Londerville & Main, 1981; Zahn-Waxler, Radke-Yarrow, & King, 1979). These findings are consistent with supposing that parental warmth plays a motivational role in children's internalization of values. The motivating power of parental affection is also implicit in the finding that love-withdrawal can serve as a mechanism of discipline (Hoffman, 1970): Children are highly motivated to avoid behaving in a manner that results in love-withdrawal.

Nevertheless, while the power of love-withdrawal results from the motivational properties of the human affectional system, there remains considerable doubt about the extent to which love-withdrawal produces internalization (Brody & Shaffer, 1982). In conceptualizing this phenomenon, it should be noted that most parent-child disciplinary encounters have elements of power assertion, love-withdrawal and induction. Moreover, parents commonly use different disciplinary methods in response to different situations (e.g., Brody & Shaffer, 1982; Grusec & Goodnow, 1994; Hoffman, 1994). The entire context of an inductive disciplinary encounter carries an inevitable implication that the parent disapproves of the child's behavior. Minimally, it is a note of dissonance, if not love-withdrawal, in an otherwise affectively positive parent-child relationship. Induction, as Hoffman (1983) notes, involves criticism of the child's behavior but in a way that does not threaten the overall relationship between parent and child. It is therefore reasonable to suppose that inductions tap into the same motivational system as love-withdrawal. However, they do so at a lower level that produces low-level guilt in the child and motivation to restore the temporary departure from the generally positive tone of the parent-child relationship. The finding that parents who use inductive techniques also tend to have a warm parent-child relationship (Hoffman, 1970) is highly compatible with this interpretation.

Within the present perspective, it is expected that more severe forms of love-withdrawal (such as threats of a complete disruption of the parent-child relationship) would lead to intense anxiety in the child. Indeed, Hoffman (1970; p. 285) states that love-withdrawal involves relatively prolonged episodes that pose "the threat of abandonment or separation." The parent-child

relationship characterized by this type of disciplinary encounter would be ambivalent at best and not properly described as warm and affectionate.

Warmth is intimately involved in the effects of power assertive styles of discipline as well. Fairly high levels of parental control and even power assertive styles of discipline are more effective with children if the control is accompanied by parental warmth (Brody & Shaffer, 1982; Grusec & Goodnow, 1994; Hoffman, 1970). Within the present perspective, power assertive discipline combined with warmth has this effect because children in warm parent-child relationships are more motivated to maintain the relationship even when this involves costs to them. Similarly, parents in warm parent-child relationships are expected to be more motivated to maintain close relationships with their children. They are therefore more likely to avoid negative confrontations with their children and more likely to avoid highly detailed, explicit requirements in the expectation that in the long run children will be motivated to comply with parental requirements if the affective quality of the relationship is maintained (Goodnow, 1992; Higgins, 1981, 1989).

It is thus not surprising that measures of warmth and control are difficult to separate in practice (Lewis, 1981). Warm parents are more likely in general to use inductive reasoning successfully, at least partly because of the motivating role of parental warmth, and children are more (internally) motivated to comply with instances of power assertion by warm parents. Warm parents may well criticize children's non-compliant behavior and often expect children to conform to very high parental standards. But the dissonances resulting from the strictures related to these issues occur within a context in which the overall positive affective tone of the relationship is not in jeopardy.

*A Hierarchical Perspective on Warmth as a Motivational System.* The perspective developed here is compatible with a hierarchical system of motivation (see Emmons, 1989) in which many of the highest level human goals, such as affection and love, are profoundly shaped by our ontogenetic and phylogenetic history (MacDonald, 1991; 1995b). In this view, evolution does not act by programming for a host of motivational (reward) systems geared for specific environmental contingencies. Rather, the affectional system motivates behavior partly by facilitating the transmission of parental values and culture. As a result, a child may be motivated to refrain from drug use and getting pregnant and work diligently in school (behaviors with high potential costs or benefits) in order to preserve a relationship based on reciprocated affection.

The human affectional system may therefore be viewed as a mechanism that can influence children's behavior in a wide range of situations that evolution could never have foreseen. Warmth as an adaptation therefore fits well into the fundamental logic of the interaction between domain-specific (warmth) and domain-general adaptations described above: Warmth is a domain-specific system in the sense that it results in a well-defined emotional response to particular types of stimulation—the stimulation that is typical of warm parent-child relationships. However,

children in warm, affectionate parent-child relationships are more likely to profit from adults' greater cognitive competence, greater experience, and lower impulsivity in the pursuit of long term goals. These goals need not be goals derived from our evolutionary past, but may include goals such as avoiding drug use, that are unique to contemporary society.

*Warmth and Attachment Security.* Finally, contrary to recent theorizing, I propose that it is the affectional system, not security of attachment that underlies internalization. The analysis in terms of warmth as an evolved motivational system is consistent with supposing that warmth and security of attachment are two independent systems with different motivating emotions. In previous work (MacDonald, 1992) I have given several reasons to distinguish warmth from security of attachment, although there is often a very large overlap between warm parent-child relationships and secure attachment, at least in samples from Western societies. Particularly relevant is the finding that despite the virtual absence of sex differences in attachment classification, there are theoretically expected robust sex differences in warmth as a personality dimension (Trapnell & Wiggins, 1990). Girls are also more prone to engage in intimate, confiding relationships than boys throughout development (Berndt, 1986; Buhrmester & Furman, 1987; Douvan & Adelson, 1966; Hunter & Youniss, 1982). Females also tend generally to place greater emphasis on love and personal intimacy in sexual relationships (Buss & Schmitt, 1993; Douvan & Adelson, 1966; Haas, 1979; Hinde, 1984; Lewis et al, 1978; Kenrick & Trost, 1989; Miller & Simon, 1980; Normal & Harris, 1981; Peplau et al, 1977). Females are more empathic and desire higher intimacy in relationships (Lang-Takoc & Osterweil, 1992), and both sexes perceive friendships with women as closer, richer, more intimate, more empathic, and more therapeutic (Aukett et al, 1988; Buhrke & Fuqua, 1987; Reis et al, 1985; Wright & Scanlon, 1991). Because of its central role in underlying parental investment, nurturance of children, and mate selection, it is expected that there will be mean differences in the affectional system such that females are more attracted to close, intimate relationships of love and affection. Such relationships are particularly important to females because they serve as a cue to male investment in children.

Also relevant is Ainsworth's (1967) Ugandan study indicating that secure attachment can occur in the absence of parent-child warmth. These results are corroborated by other studies indicating minimal parent-child and husband-wife warmth in African and African-derived samples in the presence of a robust attachment system (see also Ainsworth, 1977; Draper, 1989; Field, 1994; LeVine & LeVine, 1966, 1988). These considerations suggest that one could test whether security of attachment in the absence of warmth facilitates children's internalization of values. One could do so by studying the correlates of security of attachment in samples, such as Ainsworth's Ugandan sample, where security of attachment is not confounded by the presence of parent-child warmth.

Within Bowlby's theory, the attachment system is conceptualized as a system designed by natural selection to keep infants and very young children close to adults. Its basic emotions are fear

and anxiety in the absence of caregivers and a feeling of safety or “felt security” in the presence of caregivers who are responsive to evolved infant desires for proximity maintenance. These desires for proximity are triggered especially in unfamiliar surroundings or in the presence of strangers. As a result of experiences with caregivers, children build up generalized internal working models of expectations regarding relationships. These models, while having a certain degree of inertia, may be revised by later experiences with relationships.

Such a conceptualization of attachment implies that there is a great deal of domain-generality to attachment as an adaptation. Within current attachment theory (e.g., Bretherton, 1991), internal working models of relationships differ little if at all from other schemas. These models may be constantly updated and, like social learning, allow the organism to successfully adapt to relatively variable, non-recurrent and unpredictable aspects of the environment. While such a perspective is certainly theoretically conceivable, the implication is that the central construct of a system that is proposed to be fundamental to perhaps the most basic task facing humans—regulating relationships central to reproduction and parental investment—does not presuppose the evolution of any specialized cognitive or affective mechanisms. Moreover, it is at least paradoxical that while all of the other life history variables related to parental investment show heritability, within standard attachment theory the tendency to form close, intimate relationships is conceptualized as a function of developing cognitive schemas that differ solely as a function of the relationships the child is exposed to.

The contrary view is that the cognitive and affective foundations of close relationships involve highly specialized, domain-specific systems. Central to this perspective is that a critical component of the affectional system is a specialized reward system in which such relationships are experienced as pleasurable. Rather than suppose that children develop generalized, but highly flexible expectations of relationships, the domain-specific view is compatible with *compartmentalized* relationships in which the affectional system is preferentially directed at family members and other intimate associates, while relationships with others—especially outgroup members—may be exploitative.

The difficulty for attachment theorists within the Bowlby tradition is to specify how and why a system designed to provide security in the face of threat would come to underlie intimate relationships of love and affection and be strongly associated with high-investment parenting and children’s internalization of values. The attachment system is present in a great many animal species that do not form pair bonds or have paternal investment in offspring. It is a system whose central emotions are fear and the feeling of safety, emotions that are quite separate from love and affection. Minimally, there is a need to suppose that a system designed for proximity maintenance was transformed at some point in human evolution into a system designed to underlie parental investment and close family relationships. Yet the evidence from Ainsworth’s Uganda study as well

as the other material mentioned above indicates that these systems remain conceptually and empirically separable. Such a transformation could have occurred in some human groups, but all the evidence indicates that if so, it was accompanied by a new motivational system centered around warmth and affection with emotions quite different from fear and felt security. Therefore, one must assume a qualitative shift from previously existing systems designed for proximity maintenance.

Fundamentally, what is required is a theory of why and how some relationships are pleasurable to begin with, so that children's expectations of relationships may include, at least as one alternative, positive affective involvement with another person—what we term love. There is no reason to suppose that such a system is present in many animals with well-developed attachment systems, and positing an evolved reward system underlying close relationships is consistent with considerable evidence from personality research and neurobiology.

## V. CONCLUSION

The main message of the foregoing is the coherence of individual development. An evolutionary perspective is certainly compatible with the general idea that specific, highly dedicated systems will evolve as a response to highly specific adaptive problems. Here I have discussed the human affectional system as a highly dedicated system that functions to make family relationships rewarding and, ultimately, to produce high-quality children. I also noted that adolescents are relatively prone to impulsivity and risk taking behavior (including behavior related to low-investment sexual relationships). Within an evolutionary approach to personality systems, these traits may be conceptualized as domain-specific elements of behavioral approach systems (Factor I of the Five-Factor Model). These traits are also psychometrically and neurophysiologically linked with aggression, dominance, and attraction to reward, including attraction to sexual behavior (MacDonald, 1995b).

It is of interest that these traits, including the promiscuous sexual activity loading on the Disinhibition subscale of Sensation Seeking (Zuckerman, 1979), and aggression (Wilson & Daly, 1985) peak in late adolescence and young adulthood, followed by a gradual decline during adulthood. This “young male syndrome” is highly compatible with evolutionary thinking: Sex-differentiated systems are expected to be strongest at the time of sexual maturation and maximum divergence of reproductive strategies. Because mating is theorized to be relatively problematic for males, it is during young adulthood, when males are attempting to establish themselves in the wider group and accumulate resources necessary for mating, that the male tendencies toward sensation seeking, risk taking and aggression are expected to be at their peak.

From the present perspective, it is during this period when the internalization of parental values may be of critical importance as a force that counteracts these adolescent tendencies toward risk-taking, impulsivity, and low-investment sexual relationships. Again, the parent-child system is

a co-evolving system. Like personality systems within an individual which pull in different directions and result in intra-psychic conflict (MacDonald, 1995b), there may be conflicts within the co-evolving parent-child system that function to moderate and channel the children's evolved tendencies in an adaptive manner. While there are excellent reasons to suppose that adolescent risk-taking is a highly adaptive general tendency, it is also reasonable to suppose that an important aspect of high-investment parenting involves moderating and channeling these adolescent tendencies in an adaptive manner.

However, while domain-specific systems are of undoubted importance in conceptualizing human development, there is also a fundamental coherence to development centered around intelligence as a powerful domain-general human faculty. The big picture is that there is a very large and socially important coherence to individual development. On the whole, smarter people are better parents and they are prone to providing affectionate, supportive, and stimulating environments for children. They are also better role models, and their children are more likely to attend to them and be concerned with parental approval of their behavior. The children of these high-investment parents are also better able to benefit from all of this parental solicitude.

From an evolutionary perspective, this very large coherence of individual development makes excellent adaptive sense. Parental investment looms as a critically important activity which has a unifying force on development because it is intimately related to reproductive success in ancestral environments. All things being equal, individuals who invest highly in children must be able to incorporate themselves in viable family relationships, and they must be able to inhibit attraction to short term gains (e.g., low-investment sexual relationships) in favor of long term benefits. Correspondingly, their children must be programmed to benefit from the added attention and the better advice their parents are able to provide.

Ultimately, there must be a reproductive payoff for whatever levels of parental investment are viable. In ancestral environments, individuals who failed to invest sufficiently in children must have been out-competed in at least some times and places by those who did. But there remains considerable variation in parental investment in the contemporary world. And it has presumably always been the case that individuals who invest too much in their children were outcompeted by those who concentrated instead on finding additional low-investment mating opportunities. And while individual differences in parental investment represent the vestiges of viable adaptive strategies in ancestral environments, it is, as always, an open question what levels of parental investment will be successful in the contemporary world or the future.

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