SOCIAL WITHDRAWAL, INHIBITION, AND SHYNESS IN CHILDHOOD

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Preface

Social withdrawal, social inhibition, shyness, reticence, and social isolation are terms that conjur up an image of an individual who spends time in solitude, alone, not interacting with others. Oft-times, some of these terms carry with them additional images—social anxiety, felt insecurity, fearfulness, wariness, loneliness. Yet, despite some shared meaning, a cursory reading of the literature suggests that the underlying causal mechanisms and developmental origins of each of these terms may vary. The primary purpose of this book, therefore, is to provide a state-of-the-art perspective on the origins, correlates, and consequences of social solitude in childhood.

Psychologists of varying theoretical persuasions have long held that social experiences are critical to normal developmental trajectories and that the lack of such experiences are worthy of compensatory attention. Surprisingly, however, little empirical attention has been directed to the study of the psychological significance of social solitude for children; as such, the publication of this volume is timely. The timeliness of publication is underscored by the common fact that *social withdrawal, inhibition,* and *shyness,* the terms that share the title of this volume, are often used interchangeably. This has led, no doubt, to a good deal of confusion in the developmental and clinical literatures. Thus, it is thought by some that solitude (howsoever defined) is not a developmental risk factor. One purpose of this volume is to present the reader with an understanding of how both halves of the previous statement can be true—that is, some forms of solitude may reflect maladaptation, others may not; some forms of solitude may predict negative outcomes, others may not.

In an effort to shed new light on the meanings and developmental course

of social solitude in childhood, a group of esteemed scholars from Europe and North America was invited to share and exchange information in a lovely, isolated retreat in Doon, Ontario. The three day meeting took place in the summer of 1990; an international audience of researchers actively involved in the study of social withdrawal, social inhibition, or shyness in childhood was led in discussion by those scholars whose chapters are published herein. All but one discussion leader was able to submit a final draft by our final deadline. The product of their efforts is published in this multi-faceted volume.

The intellectually stimulating three-day meeting of scholars and the publication of this book would not have been possible without the financial support of the MacArthur Foundation (USA) and the Social Sciences and Humanities Research Council of Canada. We gratefully acknowledge their generous assistance. Special thanks are extended also to the assistants and secretaries at the University of Waterloo who devoted their precious time to the organizational matters required to bring together, in a rather remote setting, scientists from many countries: Latha Ramasubramanian, the workshop coordinator; Denise Mueller and Christine Schwendinger, Psychology Department secretaries; and Alice Bast, Psychology Department Administrative Assistant contributed enormously to the success of this symposium.

We hope that you, the reader, find the contents of this volume sufficiently stimulating to join us in our quest to better understand the developmental meanings, causes, and courses of social withdrawal, inhibition, and shyness in childhood.

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I CONCEPTUAL AND METHODOLOGICAL ISSUES: AN OVERVIEW

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1 Social Withdrawal, Inhibition, and Shyness in Childhood: Conceptual and Definitional Issues

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What is meant by the terms "social withdrawal," "social inhibition," and "shyness?" Can these terms be used interchangeably? Are they used interchangeably when, for good reason, they should not? Do each of these terms, themselves, carry with them a variety of meanings?

These definitional questions are addressed in this chapter. Furthermore, conceptual, theoretical, developmental, and applied issues are discussed. But, to begin with, it is necessary to provide a rationale for the publication of this volume. From a personal perspective, the most facile way of doing so is to examine portions of two letters I received several years ago. These letters arrived in my office shortly after a description of the *Waterloo Longitudinal Project* (see Chapter 14) was carried in newspapers by the North American wire services.

The first letter provides the reader with a hint about the issues involved in the study of the development of social withdrawal, inhibition, and shyness—issues of biological disposition (Chapters 2, 3, 4, 5, 9), parental attributions and beliefs (Chapter 7), parent-child relationships (Chapters 4, 5, 6, 7), and extra-familial relationships (Chapters 8, 10, 11, 12, 13, 14, 15).

> I am a former elementary school teacher and I am very aware of the importance of a child's readiness in all areas—social as well as academic, physical, and emotional.
>
> My daughter and I have never been close. She was one who as a baby would stop crying when I set her on the floor instead of cuddling her. I gave up my career to do special things with her and we oftentimes clash. She prefers doing things alone instead of playing cards with me or other game-like involvement.

> We had her repeat kindergarten for social reasons only. She would oftentimes say things like "Susie isn't nice to me." Last March on her own she told me she did not want to go to first grade. She is very passive at school, does not want group attention, prefers to play alone but likes to watch others play (she looks like she wants to be a part of the group but doesn't know how).
>
> I feel that Julie was born this way. This is not because I don't want to blame myself. But this all started when she was a toddler. She was very independent around both of us. My husband is a very close participating member of the family. I know this is hard for you to give any suggestions without knowing our family but we are very close knit and happy. We have real need to help our daughter Julie because I feel it will get much worse for her when she's in school in the fall the whole day.

The second letter concerns outcomes of social withdrawal. It provides the reader and researcher with an urgent sense for the necessity of longitudinal data (Chapters 4, 5, 6, 13, 14, and 15).

> I am taking the liberty of writing to you regarding an article in the newspaper last evening entitled "Socially-Withdrawn Child Studied."
>
> I am now 51-years-of-age but definitely can identify with the article which appeared. I just wish—oh how I wish that in-depth studies were done regarding the severity of the problem in my formative years.
>
> I have been employed for 27 years in the same position (stenographer) but my personality problem has been a detriment to me in my adult years.
>
> I recall one instance in my third year of grade school and my teacher approached me after recess with the enquiry "have you no one to play with—I have noticed you standing by yourself at recess for several days now." I recall replying and *LYING*—"yes I've friends." The teacher was observant and I give her credit for this, however, I wish, oh how I wish, something had been done about my isolation at the tender age of 7 or 8. It has been a long, lonely road.
>
> Again my apologies for taking the liberty of writing but am so happy, so very, very happy, that help is in store for the self-isolated child.
>
> Thank you for listening to me.

Taken together these letters, and (a) the belief that social solitude is something that concerns and worries parents (Chapter 7), and (b) that it is perceived as deviant by age-mates (Chapter 11) mark the *lack* of socially interactive behavior for special attention. In the section that follows, we examine the phenomena of social withdrawal and shyness. A conceptual introduction to research on inhibition may be found in Chapter 2.

SOCIAL WITHDRAWAL: CONCEPTUAL AND THEORETICAL UNDERPINNINGS

Normal Developmental Perspectives. From our point of view, much of the *developmental* research extant concerning social withdrawal has its origins, not so much centered on the significance of behavioral solitude or a lack of social interaction in childhood, but rather on the importance of social exchange for normal growth and development. Thus, the conceptual underpinnings for much of the research on social withdrawal are drawn from the writings of Piaget and Sullivan concerning the significance of social *interaction* in human development.

Piaget (1970), for example, believed that the acquisition of knowledge stemmed from the product of an interaction between the subject (ostensibly the child) and the object of his or her attention. When the object of attention is another human, the child's thoughts, beliefs, or ideas are referred to as *social*-cognitions. In Piaget's earliest writings (Piaget, 1926, 1932), the preoperational child's social thoughts, ideas, and beliefs were portrayed as being highly biased in an egocentered direction. Other people were thought to think and feel about the world, and literally to see the world, in ways identical, if not highly similar to the young, preoperational child. In strictly Piagetian terms, the functional invariant of assimilation was considered to take primacy over accommodation. Traditional interpretations of Piaget's early work have suggested that suddenly and discontinuously, at some point in mid-childhood, the child becomes capable of sociocentered thought (Piaget, 1967): "At about the age of seven, the child becomes capable of cooperation because he no longer confuses his own point of view with that of others" (p. 39).

Although European and North American psychologists have long debated the age at which childhood egocentrism wanes, and although there are stage-type models of perspective-taking that suggest the phenomenon need not be considered either entirely present or absent (Selman, 1980), researchers in the 1960s and 1970s used the construct of egocentrism to explain why it was that young, preschool-aged children appeared more aggressive, less altruistic, and less cooperative than their early elementary school-aged counterparts (see Shantz, 1983 for a review). Indeed, to this day, psychologists infer that individual differences in social behavior can be accounted for by deficiencies or competencies in the abilities to (a) understand the thoughts, feelings, and intentions of others and (b) to consider the consequences of one's social behaviors for the self and for others (Dodge, 1986; Rubin & Krasnor, 1986; Selman, 1985; Shantz, 1983).

If perspective-taking in particular, and social cognition in general, does account for the expression of competent social behavior, how then does

social cognition itself develop? The answer to this question is addressed in the following quotations:

1. Piaget (1928) believes that the major vehicle for the developmental decline of . . . cognitive egocentrism is social interaction, especially with peers. Conflicts, arguments, and other dissonant interpersonal experiences gradually compel the child to pay attention to perspective differences, and thereby eventually to generate some conceptions and information gathering skills regarding human psychological processes (Flavell, 1970, p. 1027).
2. The individual's cognitive coordinations may be actualized by social coordinations. This means that the individual must coordinate his actions with those of others as a first step towards mastering individualized systems of coordination (Doise, 1985, p. 297).
3. Social interaction may not be necessary for the emergence of some intelligent behaviors . . . but a sine qua non for others (e.g., organizing resources for problem solving utilizing the other people in one's surround) (Hartup, 1985, p. 73).

In short, there are strongly held theoretically driven beliefs that social interaction, and particularly peer interaction, serves as an impetus for the development of mature social thinking. In turn, it is posited that mature, sociocentered thinking provides an essential basis for the production of adaptive social behavior.

These beliefs found empirical support during the 1970s; during this decade, numerous researchers attempted to forge an empirical link between peer interaction, perspective-taking skills, and the development of socially adaptive and maladaptive behavior. For example, evidence for the relation between peer interaction and the development of social-cognition was derived from experimental demonstrations that peer exchange, conversations, and interactions produced *intrapersonal* cognitive conflict and a subsequent decline of egocentered thinking (e.g., Damon, 1977; Doise, Mugny, & Perret-Clermont, 1975). Evidence for an association between the *inability* to perspective-take and the demonstration of *maladaptive* social behavior and the experience of qualitatively poor peer relationshipswas also drawn from experimental work published in the 1970s (e.g., Chandler, 1973). Furthermore, research in the same decade demonstrated that perspective taking skills could be improved through peer interactive experiences, particularly those experiences that involved role-play or sociodramatic play. In turn, such improvement led to increases in prosocial behavior (Iannotti, 1978) and to decreases in aggressive behavior (Chandler, 1973).

From the statements offered earlier, it may be concluded that peer interaction is a significant force in the development of social cognition and,

ultimately, in the development and display of adaptive social behavior. Social interaction, by drawing the child into peer groups, allows him or her to understand the rules and norms for these peer subcultures. It is this understanding of norms and of normative performance levels engenders, in the child, an ability to evaluate his or her own competency levels against the perceived standards of the peer group. Thus, in addition to facilitating the development of social-cognition, peer interaction enables the child to make self-appraisals and to understand the self in relation to significant others.

This view is not new; George Herbert Mead (1934) addressed this issue of self definition and identity almost sixty years ago (see also Chapter 12). He suggested that exchanges among peers, whether experienced in the arenas of cooperation or competition, conflict or friendly discussion, allowed the child to gain an understanding of the self as both a subject and an object. Understanding that the self could be an object of others' perspectives gradually evolved into the conceptualization of a "generalized other" or an organized and coordinated perspective of the "social" group. In turn, recognition of the generalized other led to the emergence of an organized sense of self.

From the theoretical perspectives outlined briefly here, it seems clear that peer interactive experiences are essential for normal social-cognitive and social behavioral development. Data supportive of these theoretical premises have led to the conclusion that peer interaction is a highly significant developmental force (see Hartup, 1983; Rubin & Coplan, in press; Schneider, Rubin, & Ledingham, 1985 for reviews). The study of *social solitude or withdrawal* is implicated in this conclusion when one asks about the consequences that befall children who do not interact with peers as often as is the norm for their age group. *Regardless* of the reasons for non-social behavior, whether it is voluntary or involuntary (see Asendorpf, 1990, and Chapter 13), whether it is associated with a biological disposition (Chapters 2, 3, 4, 5, 6, 9) or with felt insecurity derived from a poor parent-child relationship (Chapters 5, 6, 7, 14), those who propose that peer interaction plays a causal role in normal growth and development would likely express concern for the child who fails to interact, at a normal rate, with peers. In summary, one conceptual basis for the study of social withdrawal stems from the theory and data of those who propose that peer interactive experiences are critical for *normal* development.

Abnormal Developmental Perspectives. A second impetus for studying social withdrawal stems from those concerned with *abnormal development.* The term "social withdrawal" can be found in almost every textbook on abnormal or clinical child psychology (e.g., Achenbach, 1982; Quay & Werry, 1986; Rosenberg, Wilson, Maheady, & Sindelar, 1991; Wicks-Nelson & Israel, 1989). It can also be found on most standardized

assessments of abnormal socio-emotional development (e.g., Achenbach & Edelbrock, 1983). The phenomenon is cited consistently as evidence for an "overcontrolled disorder" (e.g., Lewis & Miller, 1990) or an internalizing problem (Achenbach & Edelbrock, 1981). In source after source, social withdrawal is contrasted with aggression as one of the two most consistently identified major dimensions of disturbed behavior in childhood (e.g., Moscowitz, Schwartzman, & Ledingham, 1985; Parker & Asher, 1987). Indeed, the lack of social interaction has been implicated in several DSM-III-R categories of psychopathology (e.g., adjustment disorder with withdrawal; avoidant personality disorder).

Given the seriousness with which social withdrawal in childhood is viewed by clinicians, it is not surprising that a multitude of treatment programs have been developed to help ameliorate the "problem" or to help prevent the negative consequences of the phenomenon (e.g., Furman, Rahe, & Hartup, 1979; Rubin, Hymel, Mills, & Rose-Krasnor, 1991; Strain & Kerr, 1981). Thus, many practitioners view social withdrawal as a problem in-and-of itself, and perhaps with a mind's eye on developmental theory, they believe the phenomenon is a potential cause or reflection of associated difficulties such as poor perspective-taking skills, negative self-esteem, loneliness, or depression.

Yet, despite these clinically derived concerns, it is the case that many clinical researchers have concluded that social withdrawal is *not* a risk factor in childhood (e.g., Kohlberg, LaCrosse, & Ricks, 1972; Robins, 1966). It is important to note, however, that this conclusion has been drawn generally from methodologically and conceptually weak data bases (see Chapter 14 for further discussion). Moreover, it has been unclear whether social withdrawal, as assessed in these early clinical investigations, remotely resembled the measurement or conceptualization of social withdrawal in more recent research. Indeed, it is now known that social withdrawal has a multitude of "faces," some of which may be more symptomatic or predictive of negative psychological outcomes than others (Rubin & Mills, 1988). It is this latter difficulty of definition that has led, in no small part, to our efforts in publishing the present volume.

In summary, it would appear safe to conclude that the study of social withdrawal gains its impetus from (a) theory and research concerning the significance of peer interaction for normal development, and (b) clinical beliefs that the phenomenon reflects disturbance that is worthy of prevention and treatment. It would also appear reasonable to conclude that the term "social withdrawal" conjurs up a wide variety of meanings to researchers; the result of this multitude of meanings may be that, in some disciplines or sub-disciplines, social withdrawal is viewed as an inconsequential force in human development.

DEFINING SOCIAL WITHDRAWAL

Thus far, we have used the term "social withdrawal" to the exclusion of the terms that share with it the title of this volume—"inhibition" and "shyness." It is our belief that these three constructs are intertwined and yet carry with them rather different meanings. The common thread that runs through these constructs is the behavioral expression of solitude. A thorough and extended discussion of the meaning of behavioral inhibition follows in Chapter 2. In this section, a brief historical and conceptual treatment of definitional issues pertaining to social withdrawal and shyness is presented.

What is meant by social withdrawal? Perhaps the most accurate response is "It depends on who one asks." A brief survey of the literature reveals that the following terms have been used interchangeably—social withdrawal, social isolation, sociometric neglect, sociometric rejection, shyness, inhibition, and social reticence.

In the hopes of establishing what social withdrawal is, it seems reasonable to begin by circuitously clarifying what it is *not!* Thus, we commence with reference to the literature on children's peer relationships, particularly manuscripts published in the 1970s concerning peer acceptance and rejection. Definitional confusion abounds in this work; consequently, it is not surprising that the same term may conjur up a multitude of meanings to a given audience.

For example, in the 1970s, a large number of researchers became interested in children's peer relationships and in how children acquired sociometrically assessed acceptance or popularity. One label that sociometricians applied to those who were unpopular amongst or unaccepted by their peers was "the socially isolated child." Oden and Asher (1977) were exemplary in this regard when they began their oft-cited manuscript concerning a social skills intervention program for *unpopular* children by writing, "Children who are socially isolated from their peers have limited opportunities for social learning" (Oden & Asher, 1977, p. 495). They concluded their manuscript by noting that their "coaching procedure was effective in increasing *isolated* children's peer acceptance."

These "isolated children" were unpopular, but were they also socially withdrawn? Did they play alone more often than their less isolated age-mates? And if they were alone more often than their more popular counterparts, was it because they were isolated *by* the peer group or because they isolated themselves *from* the group to begin with? Interestingly, and at the same time confusingly, sociometricians argued that the isolated child was *not* one who had a low frequency of interaction with peers (e.g., Asher, Markell, & Hymel, 1982). Thus, it was proposed that being isolated *by* peers (i.e., unaccepted) was conceptually distinct from socially withdrawing *from*

peers. This was an important, but subtle, distinction, and it is one that has gained credence and acceptance in the contemporary literature on children's peer relationships (e.g., Asher & Coie, 1990). However, during the 1980s, this distinction between being isolated by peers and withdrawing in the face of peers led only to controversy and confusion. The confusion was caused, in part, by the sub-classification of different groups of sociometrically isolated children.

In the early 1980s, sociometricians distinguished between children who were actively disliked by their peers and those who received few, if any, positive *and* negative nominations as a best friend or playmate by their classmates (e.g., Coie & Dodge, 1983). The former group was identified as "rejected," the latter as "neglected." Both groups represented sub-classifications of earlier identified "isolated children."

Subsequently, in a series of papers, researchers attempted to examine the "causes" of peer acceptance and rejection. Dodge, Murphy, and Buchsbaum (1984) concluded from their own research that "children who respond with *withdrawal* [in peer situations] have a high probability of achieving *neglected* status among peers" and "that the characteristic behavior of [sociometrically] neglected children is withdrawal" (p. 171). From these statements, one would be led to assume that some children identified in the 1970s as "isolated" were also "withdrawn," despite the aforementioned conclusion reached earlier by Asher and colleagues (1982) that rate of interaction was unrelated to sociometric isolation. The new classification system, however, allowed sociometric isolation to be construed as either active (rejection = many negative nominations) or passive (neglect = few nominations of any sort). From data produced in the early 1980s, passive isolation or sociometric neglect was equated with social withdrawal. The most forceful statement concerning the relation between sociometric status and social withdrawal emanated from the writings of Coie and Kupersmidt (1983).

> These two facts about neglected boys—that they rarely offend others and that they seem to be able to become socially outgoing in new, small-group situations—may account for the evidence that they are not a group that is at long-term risk because of their social adjustment. In a follow-up study of socially withdrawn and isolated children who had originally been referred to the Dallas Child Guidance Clinic but not treated, Morris, Soroker, and Burns (1954) found that these children were not significantly at risk for psychiatric disorder. (p. 1415)

This statement, and others like it, led many researchers to infer an equivalence between sociometric classifications and behavioral prototypes. Sociometrically rejected or disliked children were assumed to be aggressive,

sociometrically neglected children were withdrawn. This equation of sociometric neglect and behavioral withdrawal, when taken in tandem with the consistent finding that sociometrically neglected children rarely differed from their "average" counterparts on measures of psychological maladaptation (see Rubin & Coplan, in press for a review) gave added strength to the traditional clinical assumption that socially withdrawn children did not represent a group "at risk" for later difficulty.

Two comments are worth making at this juncture. First, there is actually very little empirical research to support the view that children who interact rarely with peers are sociometrically neglected. Indeed, there is growing evidence to suggest that with increasing age, children described as passive, sedentary loners are more likely to be actively disliked rather than passively neglected by peers (see Chapters 11 and 14). Second, the way social withdrawal is generally construed has little to do with peer reputation. Instead, *social withdrawal refers to the act of being alone,* of not interacting with others.

The bottom line is that social withdrawal is a behavioral term that should not be confused with *any* sociometric classification. Furthermore, social withdrawal should not be confused with the term social isolation. One may isolate oneself from the peer group and one may be isolated by the peer group. The former phenomenon is nicely illustrated by the item on Masten, Morison, and Pellegrini's (1985) Revised Class Play, "Someone who would rather play alone." The latter phenomenon is illustrated by the item "Someone who is often left out," which we take as a rejection item. It is entirely possible that there are some children who prefer to play alone and whose play while alone becomes salient and negatively perceived by the peer group. In this case the withdrawn child may become isolated by the peer group. Nevertheless, it is important to distinguish between withdrawal and isolation. Withdrawal has something to do with staying away from the peer group; isolation has something to do with the peer group's staying away from someone (see also Younger & Daniels, in press, for empirical support of this distinction).

Empirically, we have found that indices of withdrawal *from* the peer group are significantly associated with indices of isolation *by* the peer group, especially in late childhood (e.g., Hymel & Rubin, 1985; Rubin, Hymel, & Chen, in press; Rubin & Mills, 1988). But assessments and observations of aggression are likewise significantly associated with isolation by peers (Coie & Kupersmidt, 1983; Dodge et al., 1984; Rubin et al., in press). The upshot of these findings is that it would serve us well to distinguish conceptually between terms used in the language of sociometry and terms associated with behavioral observation and assessment.

In summary, it can safely be concluded that *social withdrawal is neither sociometric neglect, nor sociometric rejection, nor social isolation.* What

then does this leave us with? For purposes of this volume, social withdrawal refers to a behavior best described as *solitude.* Although this clarifies the meaning of social withdrawal for the reader, it does little to explain the components or factors that may lead to its demonstration. These latter factors allow the distinction between different forms of social withdrawal—namely, passive withdrawal, inhibition, and shyness.

DIFFERENT FACES OF SOLITUDE

For several years, a number of researchers have suggested that solitary behavior can be displayed in many different ways and for many different reasons (e.g., Asendorpf, 1990, and Chapter 13; Rubin, 1982; Rubin & Mills, 1988). For example, drawing from earlier work by Moore, Evertson, and Brophy (1974), Rubin (1982) distinguished between solitary activity that was (a) immature, sensorimotor, and repetitious (functional play), (b) constructive, (c) dramatic, and (d) exploratory. In addition, children could be alone but unoccupied or watching others (onlooker behavior). During the preschool years, or from ages 3 to 5 years, solitary-constructive play was described as adaptive; indeed it was just the sort of activity that preschool teachers nurtured (Rubin, 1982). Solitary-functional and -dramatic play, on the other hand, were characterized as immature and somewhat disruptive. These latter forms of solitude were associated with indices of maladaptation and peer rejection (Rubin, 1982). Onlooker and unoccupied behavior were found to be associated with anxiety and wariness (Asendorpf, 1990).

During the mid-to-late years of childhood, the "faces" (or phenotype) of solitude remain the same, but their meanings (or genotypes) appear to change. For example, at ages 7 and 9 years, solitary-constructive and -exploratory behavior, as observed during free play periods in the peer group, are associated with markers of anxiety, negative self-appraisals of social competence, and lack of peer acceptance (Rubin, Hymel, LeMare, & Rowden, 1990; Rubin & Mills, 1988; Chapter 14). Thus, behavior that appeared to reflect adaptation and competence in early childhood carries with it a different meaning in middle and late childhood.

The frequent display of solitary-sensorimotor and -dramatic play is found to correlate positively with indices of impulsivity and aggression during mid-to-late childhood (Rubin & Mills, 1988). These data may be somewhat surprising to those who believe that dramatic play in childhood represents the pinnacle of ludic activity. However, as early as 4 years, approximately 70% of pretense, *when observed in a group setting,* is carried out cooperatively with others (Rubin, Fein, & Vandenberg, 1983). Solitary-pretense thus stands out like the veritable "sore thumb," especially when manifested frequently in the company of peers.

In summary, children's solitary behavior, when observed in group settings, appears to have a number of different "faces" as well as a multitude of meanings. The faces were described earlier; the meanings are discussed in the following section.

Different Meanings of Solitude. According to Asendorpf (1990, 1991, Chapter 13), the underlying "causes" of different types of solitary behavior are derived from approach and avoidance motivational mechanisms. For example, Asendorpf suggests that there are some children for whom solitude is preferred to social activity. These children may be more object- than people-oriented (Rubin, Maioni, & Hornung, 1976) and thus may prefer to be alone with toys or books. Asendorpf characterizes these children as having a low social approach motive but not necessarily a high social avoidance motive. Interestingly, this particular explanation for solitary behavior is rarely discussed in the developmental literature; when it is discussed, however, the focus is on *young,* preschool age children.

The behavioral manifestation of low social approach motivation seems best captured, *in early childhood,* by solitary-constructive and exploratory activity (Rubin, 1982). Rubin and colleagues refer to this type of play as *passive withdrawal* and during early childhood it is not contemporaneously associated with psychological maladaptation. As noted above, however, this same behavioral phenomenon *does* carry with it negative "baggage" in the middle and late years of childhood (e.g., Rubin & Mills, 1988; Chapter 14). As such, a low social approach motivation may lead developmentally, in some circumstances, to a high social avoidance motive. For example, family relationships difficulties (Chapters 4, 7), ecological hardship (Chapter 14), and peer rejection (Chapters 12, 13, 14, 15) each may contribute to the development of a high social avoidance motive in children whose solitude was originally "driven" by a low social approach motive.

A second type of withdrawn child is one who would like to engage others in interaction but for some reason is compelled to avoid them, *especially in novel settings.* This approach-avoidance conflict may lead to behavioral compromises such as observing others from afar or hovering along the margins of ongoing play groups. Thus, the solitary behavior of these internally conflicted children is not characterized by passive disinterest and solitary-constructiveness, but rather by social wariness. It is this group of children who may be representative of those described in the literature as behaviorally inhibited to the unfamiliar or shy (see Chapters 2, 3, 4, 5, 6, 9, and 13). The root cause of social inhibition, shyness, or wariness may be in the biological make-up of the child (Kagan, 1989, see also Chapter 2). Nevertheless, because these children spend much of their time away from the peer group, they may be described by some as socially withdrawn, but *primarily in novel situations.* It may be that the initial *interactive* experi-

ences of *some* of these children prove negative (e.g., they may be bullied or teased, Chapter 15) or that their initial social wariness is reinforced by over-directive and overly-protective parents (Chapters 4, 5, and 8). As such, what might initially be described as biologically-driven behavioral inhibition to novel social settings may evolve, under some circumstances, into a more general, cross-situational form of social withdrawal (Chapters 4, 14).

It is important to note that shyness or wariness in the face of social novelty may also result from the expectation of negative, or insufficiently positive, evaluation (e.g., being ignored or rejected by others during social interaction, Asendorpf, 1991, Chapter 13; Buss, 1986). The non-social behaviors of these social-evaluatively shy children are probably similar to those of the behaviorally inhibited group described above; however, their onlooking and hovering activities may be less a function of temperamentally (biologically) driven causes than of a fear of being negatively evaluated not only by strangers, but also by members of personally significant reference groups (Chapters 10 and 13).

Finally, there may also be a third group of withdrawn children—those who have high social approach and *low* social avoidance motives! Interestingly, this mix of motives has not been discussed in the literature on social withdrawal. Yet, although these motivational underpinnings would suggest that these children would be rather sociable, it may be that their production of social behavior is incompetent. As a consequence of their social incompetence, these children may be isolated *by* their peers rather than isolated *from* them (Rubin et al., 1990). Rubin and colleagues have observed that these children are the most likely to display solitary-sensorimotor, solitary-dramatic, and aggressive behaviors in the peer group. As such, it may be that their immaturity and aggressiveness leads to rejection and ultimately to their social isolation.

SUMMARY

In summary, *social withdrawal* is an "umbrella" term subsuming all forms of behavioral solitude. It is a highly complex phenomenon that carries with it many "faces" and potential causes. *Shyness* is one form of social withdrawal that is motivated by social evaluative concerns, primarily in novel settings. *Inhibition* is a form of withdrawal characterized by social aloneness or withdrawal in novel settings. The bases for inhibition are conflictual approach-avoidance motives. *Passive-withdrawal,* or quiescent, passive play with objects may have as its original basis a low approach motivation. However, this behavior, if compounded by peer domination (Chapters 14, 15) and rejection (Chapter 11) may lead to negative self perceptions of social competence (Chapter 12). Thus, with time, passive

withdrawal may have a dual motivational underpinning—low approach plus high avoidance.

The many faces and mechanisms underlying social withdrawal are described in the present volume. This state-of-the-art perspective on the phenotypes and genotypes of social withdrawal will provide the reader with an appreciation for why it is that the phenomenon has proved so "slippery" to developmental, social, and clinical psychologists. Indeed, although different "faces" of social withdrawal or solitude are described herein, it will be clear to the reader, upon completion of this volume, that there remains a critical need to examine whether different forms of solitude are equally benign or malignant vis-à-vis their association with or prediction of adaptive or maladaptive behavior. As such, this volume is intended to stimulate rather than satiate the researcher who is interested in the topics presented in this volume.

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2 On the Temperamental Categories of Inhibited and Uninhibited Children

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Two quiet revolutions gaining momentum in developmental laboratories are marked by an increased interest in the social as compared with the cognitive processes of children, and temperamental as compared with experiential factors. The different cohorts of scientists participating in these two revolutions occasionally encounter each other in studies of the extraordinary variation in social behavior that is so obvious among young children.

The renascence of temperamental constructs is due to many factors, especially to the writings of Thomas and Chess (1977), heightened awareness of intraspecific variation in closely related strains of animals (Pradhan, Arunasmitha, & Udaya, 1990; Scott & Fuller, 1965), and, finally, dramatic advances in the neurosciences that are providing new and surprising facts permitting us for the first time to entertain reasonable hypotheses relating physiology to behavior. For example, few scientists working before the Second World War would have been bold enough to suggest that an imbalance in neurotransmitters was related to serious depression, or that arrested growth of neurons in the limbic area during the prenatal months might be a major cause of autism. Both of these ideas have become popular because their empirical bases provided a scaffolding for possible explanations of very complex behaviors. Scientists are appropriately conservative and resist an explanation that does not rest on a rationale built on facts arranged in a logical argument. The environmental explanation of why a child was fearful, which was popular in the 1940s and 50s, was so familiar and reasonable, most scholars were reluctant to give it up until another equally logical one was provided. Neuroscientists are now supplying new facts that make it possible to suggest interpretations of

excessive fearfulness that involve inherited variation in neurochemistry and neurophysiology.

THE NATURE OF THE BIOLOGICAL INFLUENCE

When we shift from a parent's verbal description of the child as the source of evidence to data from the physiological laboratory, we are forced to invent a different set of concepts. The categories that summarize a patient's complaints about chills, cramps, and nausea are different from those that are based on bacterial counts and MRI scans.

As we have written elsewhere (e.g., Kagan, 1989), one class of temperamental categories containing a large number of specific behavioral profiles might be defined by inherited physiological processes that predispose small proportions of children to display particular emotions and behaviors. The features of this class of temperaments are particular combinations of neurochemicals in the cerebrospinal fluid and neurotransmitter tracts, as well as receptor densities for these chemical substances. There are over 150 known chemicals in the brain, including amino acids, monoamines, peptides, and hormones, which, along with their receptors, determine the thresholds of responsiveness in specific parts of the central nervous system. It is believed that the concentrations of many of these chemicals, as well as the densities of their receptors, are under partial genetic control (Oxenstierna, Edman, Iselius, Oreland, Ross, & Sedvall, 1986). The variation in chemistry should be correlated with stable variation in the reactivity of brain sites that influence behavior, emotional reactivity, and chronic mood, especially in the limbic system, basal ganglia, and frontal cortex. Thus, it is likely that the stable differences in behavior and physiology observed among related strains of monkeys, cats, and dogs are due, in part, to the variation in neurochemistry (Blanchard, Flannelly, & Blanchard, 1986; Scott & Fuller, 1965; Suomi, 1987). Even the genetically homogeneous strain of Sprague Dawley rats display variation in behavior in unfamiliar environments, with the less emotional animals possessing lower concentrations of dopamine and its metabolites in parts of the brain compared with highly emotional rats (Pradhan et al., 1990).

The hypothesis that physiological criteria are components of the definition of temperament does not require a reductionistic bias. This view suggests only that some infants are born with a physiology that biases them initially to be more or less likely to develop one rather than another behavioral surface given certain environments. Each child's changing behavioral profile is a historical product of particular, genetically based reactions accommodating to equally particular sequences of experience. A useful metaphor represents each person's psychological qualities as a pale grey fabric composed of many thin black and white threads—symbolic of

biology and experience—so tightly woven it is simply not possible to discern any distinctive black or white fibers.

Differential excitability in limbic sites, especially the amygdala and its multiple projections, could be a function of a wide variety of neurochemical profiles, including norepinephrine, corticotropin releasing hormone, glucocorticoids, GABA, and the opioids. It is not possible at the present time to point to any one of these as the critical molecule. We will have to wait for a reduction in uncertainty.

Meanwhile, scientists can make advances in understanding the behavioral components of the definition of temperament. Research in our own laboratory, as well as in the laboratories of others, has determined that about 15% of healthy, Caucasian, one to two year old children are extremely and consistently shy, timid, and fearful when they encounter unfamiliar situations. These children, when faced with unfamiliar people, tend to become quiet and restrained until their anxiety is reduced, timid in the face of challenge or unfamiliar objects, and avoidant of unfamiliar situations. Thus, the term *inhibited* refers not only to a shy demeanor when with unfamiliar children or adults, but also includes restraint, avoidance, and distress in confronting unfamiliar events that are not social. About one-half of these children, whom we call inhibited, retain their phenotype through the eighth year of life. The remaining half develop a normative profile with respect to shyness, restraint, and fear to unfamiliarity. But few become as bold and emotionally spontaneous as a larger group of children, about 30%, who are consistently sociable, spontaneous, and relatively fearless in the second year. These children approach unfamiliar peers and adults, are likely to enter unfamiliar situations with a short latency and are not perturbed by challenge.

Over three-fourths of this group, whom we call uninhibited, retain their style through the eighth year of life. A larger number of the uninhibited children retain their profile because this style is not subject to negative sanctions and is regarded as adaptive by both the child and his or her family. Thus, temperamental qualities are not immutable. A temperamental category simply reflects a slight bias for a certain set of behaviors. The physiology affects the probabilities that certain behaviors will occur, given particular rearing environments. There is always the opportunity for the child to learn to control the urge to withdraw to a stranger or to a large dog. Indeed, the role of the environment is more substantial in helping the child to overcome the tendency to withdraw than in making the child timid in the first place.

THE PHYSIOLOGY OF INHIBITED AND UNINHIBITED CHILDREN

The two temperamental groups differ in peripheral, physiological characteristics in ways that imply differences in the threshold of excitability of the

amygdala and its projections to the cortex, hypothalamus, sympathetic nervous system, corpus striatum, and central grey. For example, inhibited and uninhibited children differ in the magnitude of cardiac acceleration and pupillary dilation to mild stress, tension in the skeletal muscles, and magnitude of rise in diastolic blood pressure when their posture changes from sitting to standing. In addition, they tend to differ in salivary cortisol levels in the early morning, with uninhibited children showing significantly lower levels than inhibited children.

It is not unimportant that Suomi and his colleagues have found that a small group of rhesus monkeys who are timid and fearful to the unfamiliar also display physiological characteristics, such as high levels of cortisol and a high heart rate, that resemble the profile of inhibited children (Suomi, 1987). It is likely that continued study of this primate model will provide eventually a deeper understanding of the neurophysiology of inhibited and uninhibited children.

Further, the characteristics of inhibited and uninhibited children show good evidence of heritability. A major research project at the Institute of Behavioral Genetics at the University of Colorado comparing monozygotic and dizygotic twins is finding heritabilities of about .40 for children seen at 14, 20, and 24 months of age. For example, 100 monozygotic and 100 dizygotic, same sex twin pairs were seen in the laboratory at 14 and 20 months of age. Latencies to leave the mother and approach toys in an unfamiliar environment, as well as latency to approach a stranger and a discrepant object were the variables used to index inhibition. In addition, the total proportion of time the child spent proximal to the mother was quantified during a free play period, and during encounter with a stranger and an unfamiliar object. These variables were combined to create an aggregate index of inhibition. Both inhibited and uninhibited behavior showed significant heritability ($h^2 = 0.4$) (Robinson, Kagan, Reznick, & Corley, unpublished).

PREDICTION FROM INFANCY

One important question concerns the qualities of young infants that might be predictive of inhibited and uninhibited behavior in the second year. If these two temperamental categories are influenced by inherited physiological processes, it should be possible to detect early signs of the two categories in the opening months of life.

Clues to the processes one might examine come from two sources. One clue comes from work on animals suggesting that the amygdala, which receives sensory information from all modalities, is the origin of important efferent circuits that monitor variation in motor activity and crying to

unfamiliar stimulus events (Adamec & Stark-Adamec, 1986; Dunn & Everitt, 1988; Mishkin & Aggleton, 1981). One circuit originates in the basolateral area of the amygdala which projects to the ventromedial striatum and thence to the skeletal motor system. When this circuit is activated, infants should show an increase in motor activity, primarily in the form of flexing and extending of the limbs. Two other circuits involve the central nucleus of the amygdala (which receives information from the basolateral area) which projects to the cingulate cortex and central grey. Activation of these circuits can produce motor spasticity and arching of the back, and can mediate the distress calls of mammals (Jurgens, 1982). Hence, it is likely that these circuits participate in the distress cry of the human infant. Because high levels of both motor activity and crying to unfamiliar stimuli could be mediated by low thresholds in the amygdala and its projections, it follows that study of these two behaviors might supply early predictors of inhibited and uninhibited behavior.

A second clue comes from the work of Lagasse, Gruber, and Lipsitt (1989) who reported that infants who increase their sucking rate when the water they are ingesting suddenly turns sweet are likely to become inhibited in the second year while infants who show a minimal increase in sucking rate are more likely to become uninhibited. The entire corpus of evidence implies that a combination of high motor activity and frequent crying to novel stimulation might predict the later display of inhibited behavior. The complementary profile should predict uninhibited behavior.

We are studying longitudinally two large cohorts of children who were administered at four months of age a 40 minute battery involving presentation of auditory and visual stimuli. About 20–25% of these infants show frequent and vigorous motor activity—flexing and extending of the limbs, spasticity of the arms and legs, and spontaneous arches of the back—and frequent crying. These infants are called high reactive. About 40% of the infants show low levels of motor activity and rarely cry; these are called low reactive infants.

We have evaluated these infants at 14 months of age. Of the 17 episodes presented to the child at 14 months, the four that were most likely to produce a fearful reaction in the child were:

1. an unfamiliar woman opened the cabinet in the playroom revealing a metal robot and after remaining quiet for a minute, invited the child to approach and play with the robot; failure to approach was coded as fear;
2. small puppets appeared on the left or right side of the child's visual field accompanied by a taped female voice speaking a nonsense phrase in either a happy or emotional tone; crying to any of the ten trials was coded as fear;

3. the female examiner uncovered a rotating toy and spoke a nonsense phrase in an angry tone with a frown on her face; crying to this event was coded as fear;
4. if the child cried and refused to accept in his or her mouth a dropper containing liquid, that response was coded as fearful.

The data indicate that 62% of the high reactive infants were highly fearful (4 or more fears) while only 10% were minimally fearful (0 or 1 fear) when they confronted the battery of unfamiliar people, situations, and objects. By contrast, 59% of the low reactive infants were minimally fearful and only 12% highly fearful in the same contexts (see Table 2.1).

Physiological Reactivity. The infants who were both high reactive at four months and also highly fearful at 14 months differed from the low reactive-low fear children in ways that are in accord with some of the differences found for the older inhibited and uninhibited children (Kagan, Reznick, & Snidman, 1988). For example, the high reactive-high fear children showed large increases in heart rate to a drop of lemon juice, and were likely to have a cooler right than left side of the face to mild stress (based on analysis of thermography images). Further, high reactive infants had higher fetal heart rates and higher heart rates during sleep at two weeks of age while being held in an erect posture. These data suggest that the high reactive infants, many of whom become inhibited children, are under higher sympathetic tone than the low reactive infants (Snidman & Kagan, unpublished).

CATEGORIES VERSUS CONTINUA

It is important to note that we regard inhibited and uninhibited children, as well as high and low reactive infants, as belonging to two distinct qualitative categories. We do not regard the difference between inhibited and uninhibited children or high and low reactive infants as a continuous dimension.

TABLE 2.1
Proportion of High and Low Reactive Infants From Two Independent Cohorts Showing Low (0-1), Moderate (2-3) or High (4 or more) Fear at Fourteen Months (Total N = 430 from both cohorts)

Category	*N*	*Low Fear*	*Moderate Fear*	*High Fear*
High Reactive	93	10	28	62
Low Reactive	167	59	29	12

chi square = 84.3, 2df, $p < .00001$

American psychologists are prejudiced against positing categories of people, preferring to place individuals on a series of continuous psychological or biological dimensions. We believe that motor activity and irritability to unfamiliar stimuli in four month old infants are derived from different physiological processes; therefore, it seems unwise to sum the two behaviors to produce a derived variable called arousal or reactivity. We make this claim because a child with high motor activity who does not cry is qualitatively different from one who shows high motor activity and cries a great deal. The former child is less fearful and shows more positive affect in the second year. Moreover, the fears of the low motor-high cry child were more often characterized by timidity and reluctance to approach unfamiliar events rather than distress cries, while the fears of the high reactive child were characterized by both distress cries and reluctance to approach the unfamiliar.

Biologists do not base their categories of species on the addition of values on continuous traits like mass, length, or life span. A factor analysis of a dozen continuous characteristics of vertebrates would not reveal the current accepted taxonomy of fish, reptiles, birds, and mammals because it is a profile of characteristics, some of which are discontinuous (for example, internal or external fertilization), that defines a species.

One reason for the continued reliance on continua is the absence of theory to guide the parsing of persons into types. It took us several years to discover the infant reactive types and we would not have generated these categories by thought alone. Empirical measures that produce continuous distributions are easy to obtain; hence, it is prudent to rely on these continua during a pretheoretical era. But as insights occur in separate domains of inquiry, positing types will, on occasion, be useful and I submit will be helpful to theory. In a recent collaboration with Hal Stern and Don Rubin of the Department of Statistics at Harvard University, we compared a linear regression model that assumed motor activity and crying to be additive in a linear fashion in predicting fear in the second year, with a latent class analysis that assumed qualitative categories. The latter analysis was more predictive of the fear score at 14 months; infants who showed high motor activity and infrequent crying were less fearful than a linear regression analysis would predict, while low motor-frequent cry infants were more fearful than the regression model predicted.

There are many illustrations of the principle that as the values of one parameter change quantitatively the constellation of forces affecting a phenomenon can change qualitatively and create unique states. Moreover, related strains of macaques cannot be placed on a continuum of fearfulness or central nervous system arousal because each strain shows a unique profile of behavioral and physiological responses to an imposed stress (Clarke, Mason, & Moberg, 1988). That is why no scientist would combine

rhesus and fasicularis monkeys in the study of the effects of a drug on fearful behavior.

Only a small proportion of infants—about 10%—show a combination of high motor activity and frequent crying at four months, high fear in the second year, and large cardiac accelerations to psychological stress. These variables are not positively correlated in a large unselected sample, only in a small group of individuals who inherit a particular temperamental profile. Stated more formally: (1) If each of *n* dependent variables has more than one origin, and (2) these origins are dependent, (3) but one origin is common to all dependent variables for a small proportion of the sample, then (4) the correlations among the dependent variables will be low, even though there is a category of individuals who is high or low on all of the variables.

The physicist Pierre Duhem in an essay entitled "Quantity and Quality" (1954) noted that most scientists strive to describe their data in mathematical form. Because mathematicians assume continuous magnitudes as a primary axiom, psychologists have preferred to classify all phenomena in terms of continuous dimensions. They also are friendly to the additional assumption that every psychological outcome can be understood eventually as a result of the addition of these magnitudes. But Duhem adds that nature also consists of qualities that cannot be formed simply by adding quantities.

Magnusson and Allen (1983) are also friendly to this point of view, for they believe that delinquent and conduct disorder children are best detected with a profile of biological and behavioral characteristics. This position has always been popular in clinical settings. Even though the I.Q. scores of ten Downs and 90 normal children fall on a continuum, psychologists agree that the two groups are qualitatively different because of the distinctive genetic origin of the former group.

An important implication of this work is a sensitivity to two different members of the family of affects we usually call anxiety. The inhibited child is vulnerable to anxiety generated by unfamiliar people, settings, and challenges. We might call this affect "anxiety to novelty." A distinctively different affect, which might be called "anxiety over one's personal qualities," is acquired as a result of identification with one's parents, class, or ethnic group. Questionnaire scales that are presumed to measure adult anxiety contain heterogeneous groups because an individual can attain a high score for different reasons.

Finally, it should be noted that acknowledging temperamental variation among children and adults has the potential of changing the interpretation each of us imposes on the behavior of others. Almost every modern theory of personality assumes that provocation of motives, conflicts, and standards, acquired over a lifetime, can produce physiological reactions characteristic of strong emotions. But most believe that the primary source of