

Pure Versus Co-occurring Externalizing and Internalizing Symptoms in Children: The Potential Role of Socio-Developmental Milestones

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Co-occurring internalizing and externalizing disorders are moderately prevalent in children, adolescents, and adults (Anderson, Williams, McGee, & Silva, 1987; McConaughy & Skiba, 1994), but much remains to be understood regarding why some children show “pure” versus co-occurring internalizing and externalizing symptoms. One possible influence that has previously not been considered is the failure to attain socio-developmental milestones, which paradoxically may prevent the development of co-occurring symptoms for some children. The present study proposes a model in which failure to attain relevant socio-developmental milestones might explain why some children may not develop heterotypic co-occurring symptoms. Specifically, it is proposed that specific clusters of internalizing symptoms (i.e., high social anxiety, withdrawal, and inhibition) and externalizing symptoms (i.e., high impulsivity, hyperactivity, and emotional reactivity) may be associated with the failure to attain socio-developmental milestones (i.e., poor peer relations for anxious children, lack of self-reflection and evaluation for impulsive/reactive children) that, in turn, may prevent subgroups of children from developing co-occurring, heterotypic symptoms.

KEY WORDS: children; diagnosis; co-occurrence of disorders; internalizing; externalizing.

INTRODUCTION

Co-occurring internalizing and externalizing disorders are considerably prevalent in children, adolescents, and adults (Anderson et al., 1987; McConaughy & Skiba, 1994; Gilliom & Shaw, in press; Zahn-Waxler, Klimes, Dougan, & Slattery, 2000). They are found in both clinic and non-clinic samples (Lilienfeld, 2003; McConaughy & Achenbach, 1994) at rates far greater than expected by chance (Caron & Rutter, 1991; Cole & Carpentieri, 1990; Lahey, Waldman, & McBurnett, 1999; Loeber & Keenan, 1994; Loeber, Burke, Lahey, Winters, & Zera, 2000a). Research suggests that children with co-occurring disorders have a relatively early age of onset (Loeber & Keenan, 1994;

Newman, Moffitt, Caspi, & Silva, 1998), more serious and chronic disturbances (Kovacs & Devlin, 1998; Newman et al., 1998; Nottelmann & Jensen, 1995; Youngstrom, Findling, & Calabrese, 2003), higher rates of psychiatric services usage (Costello et al., 1996; Kovacs & Devlin, 1998; Newman et al., 1998), and worse developmental outcomes (Keiley, Lofthouse, Bates, Dodge, & Petit, 2003) than children with only a single diagnosis. The goal of the present paper is to further our understanding of co-occurrence by proposing a model and the conditions under which co-occurrence would *not* be expected to occur. For purposes of the present study, co-occurrence refers to the simultaneous presence of both internalizing and externalizing symptomatology within a child.

Several explanations have been proposed to account for the high frequency of co-occurring disorders in childhood. Some theories suggest that co-occurrence is an artifact of measurement overlap

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or merely the result of splitting one underlying construct (i.e., negative emotionality or overall child distress) into two separate disorders. Others propose that co-occurring disorders represent distinct, meaningful syndromes (Angold & Costello, 1992; Kovacs, Paulauskas, Gatsonis, & Richards, 1988; Lilienfeld, 2003; O'Connor, McGuire, Reiss, Hetherington, & Plomin, 1998; Seligman & Ollendick, 1998). Some of the factors that have been proposed to account for the presence of co-occurring disorders in children are shared risk factors, genetic influences, and risk factors that stem from the development of an initial disorder (e.g., externalizing disorders can result in peer rejection) (Angold & Costello, 1993; Klein & Riso, 1993; Lilienfeld, 2003; O'Connor et al., 1998; Russo & Beidel, 1994; Seligman & Ollendick, 1998). Further, aspects of internalizing are associated with externalizing symptoms and vice versa. For example, externalizing symptoms may be associated with academic and interpersonal failures which, in turn, may be associated with depressive symptoms (Patterson & Stoolmiller, 1991). Similarly, high levels of personal distress may be associated with acting out behaviors (Lemerise & Arsenio, 2000). Based on these findings, it may be difficult to understand why some children develop pure internalizing or externalizing symptoms.

Presently, co-occurring disorders in children are not very well understood. Despite their significant frequency and seriousness, there is a paucity of research to date exploring this phenomenon. This discrepancy can be partly attributed to research goals that tend to focus exclusively on internalizing or externalizing disorders, frequently either excluding participants with co-occurring symptoms or failing

to examine co-occurring symptoms within samples (Jensen, 2003; Seligman & Ollendick, 1998). Much remains to be understood regarding why some children show "pure" versus co-occurring internalizing and externalizing symptoms. One possible influence that has previously not been considered is the failure to attain socio-developmental milestones, which paradoxically may prevent the development of co-occurring symptoms for some children. The present paper will explore the potential role of socio-developmental milestones in the development of pure and co-occurring externalizing and internalizing symptoms in children through a review of existing research. Generally, it is proposed that common features of internalizing (e.g., behavioral inhibition and high anxiety) and externalizing (e.g., high impulsivity, poor executive control) disorders may be associated with the failure to attain socio-developmental milestones (e.g., healthy relationships with others, self-evaluation) that, in turn, prevent the development of co-occurring, heterotypic symptoms (see Figs. 1 and 2).

First, the present paper will summarize issues relevant to internalizing symptoms in children. Next, a similar summary for externalizing symptoms in children will be presented. The purpose of these summaries is to present a general understanding of factors associated with the developmental progression and course of internalizing and externalizing symptoms in children, specifically features of these disorders that may be relevant to socio-developmental milestones. As research has disproportionately focused on internalizing or externalizing disorders in isolation, as opposed to co-occurring symptoms, such a summary is necessary for understanding

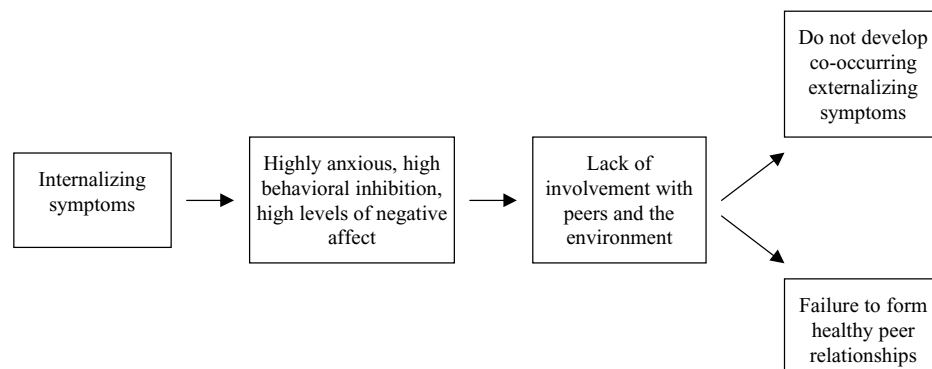


Fig. 1. Model of preventative role of specific internalizing symptoms on co-occurring externalizing symptoms.

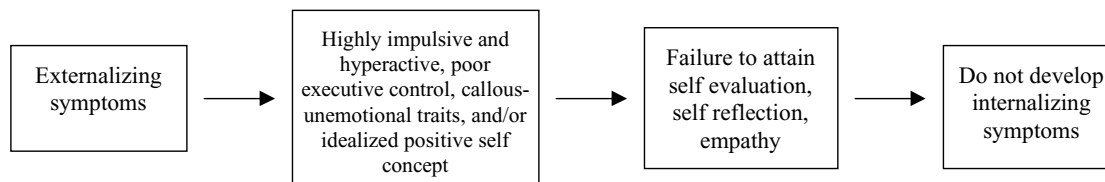


Fig. 2. Model of preventative role of specific externalizing symptoms on co-occurring internalizing symptoms in children.

co-occurring symptom patterns in children. This understanding is needed to inform models of why some children develop co-occurring symptoms and others do not. Current theoretical models for explaining co-occurring symptoms in children will then be reviewed, followed by the presentation of a model in which the failure to attain socio-developmental milestones is postulated to prevent the development of co-occurring heterotypic symptoms in children. Finally, the paper will address limitations to the proposed model, implications of research in this field, and suggestions for future directions for research within this area.

As the incidence of children meeting diagnostic criteria for internalizing and externalizing disorders is relatively small in childhood, the review will emphasize studies of symptom expression and, when possible, studies examining diagnosed disorders. Based on the need to limit the paper's scope, the focus will be restricted to depression and generalized anxiety (internalizing) and conduct, oppositional, and attention-hyperactivity symptoms (externalizing), excluding more specific internalizing and externalizing disorders (e.g., school phobia).

Internalizing Symptoms

Early adolescence is a period during which the risk of onset of depressive disorders accelerates (Hankin & Abramson, 2001; Kovacs & Devlin, 1998; Loeber & Keenan, 1994; Weissman et al., 1999), whereas the early school-age years are a common risk period for the onset of anxiety disorders, with prevalence generally decreasing as adolescence approaches (Loeber & Keenan, 1994; Weissman, 1988). Many depressive symptoms involve socio-developmental cognitive processes, such as self-reflection, self-understanding, and rumination that are typically not present until approximately 8 years of age (Kovacs & Devlin, 1998), which is congruent with the relative paucity of depressive disor-

ders prior to middle childhood. The development of depressive disorders may also be affected by the development of stable attributional and cognitive processes that are unlikely to be present prior to middle childhood (Turner & Cole, 1994). Additionally, depressive symptoms may be preceded by appraisals of other's evaluations, such that negative feedback from others may be associated with poorer self-concepts (Felson, 1989). It is typically during middle childhood that children begin to actively seek and use social information in making self-evaluations (France-Kaatrude & Smith, 1985; Stipek, 1987).

A socio-developmental milestone that is hypothesized to play a preventive mediational role against the development of co-occurring externalizing symptoms is forming healthy relationships with others. Children are exposed to peers throughout much of their development, with these relationships becoming more intimate and complex as children progress through childhood to adolescence. Many of the risk factors and cognitive and social processes, seen in children with high levels of internalizing symptoms, particularly social anxiety, are proposed to prevent the formation of healthy relationships with others. We propose that a failure to form social relationships with others may also prevent children from developing co-occurring externalizing symptoms. Specifically, it is proposed that two internalizing symptoms, social anxiety and inhibition, will lead to social withdrawal and avoidance, which in turn will prevent children from forming healthy relationships with others. As described below in more detail, the failure to attain this socio-developmental milestone is hypothesized to affect the development of co-occurring externalizing symptoms because of deficits in peer relationships. The paper will first summarize relevant research in the field, particularly in terms of associations between internalizing symptoms and difficulties establishing healthy relationships with others, particularly peers.

Risk Factors

Child, environmental, family, and genetic factors have been shown to be associated with internalizing disorders (see Tables I and II) and play important roles in the development and maintenance of internalizing problems. Of these factors, the present model focuses on internalizing symptoms that inhibit the formation of peer relationships. Therefore, review of internalizing symptoms will be limited to a discussion of internalizing symptoms that are relevant to deficits in social development.

Social Processes

Highly anxious and behaviorally inhibited children show considerable levels of social withdrawal and avoidance (Dadds, Barrett, Rapee, & Ryan, 1996; Daleiden & Vasey, 1997; Turner, Beidel, & Costello, 1987), which may result in peer rejection and neglect. Children with internalizing problems who are able to establish peer relationships also seem to have a better prognosis in general. For instance, one study found that anxious children who were able to form relationships with peers showed decreased levels of later internalizing symptoms than anxious

Table I. Family and Environmental Risk Factors Associated with Internalizing and Externalizing Symptoms

Risk factors	Internalizing	Externalizing
Family risk factors	<p>Interparental conflict (Katz & Gottman, 1993)</p> <p>Maternal depression (Angold, Costello, & Erkanli, 1999; Goodman, Adamson, Rinti, & Cole, 1994; Mufson, Aidala, & Warner, 1994)</p> <p>General parental psychopathology (Anderson & Hammen, 1993; Beidel & Turner, 1997; Kovacs & Devlin, 1998; Piffner et al., 1999)</p> <p>Parental hostility and harsh discipline (Keiley et al., 2003; Kim et al., 2003)</p> <p>Over involved parenting, and high parental control (Messer & Beidel, 1994)</p>	<p>Interparental conflict (Katz & Gottman, 1993; Kerig, 1998)</p> <p>Maternal depression (Anderson & Hammen, 1993; Angold et al., 1999; Beidel & Turner, 1997)</p> <p>Parental antisocial disorder (Lahey et al., 1995; Lahey et al., 1999; Zoccolillo, 1993)</p> <p>Parental hostility and rejection, harsh discipline, and parental punitiveness (DeKlyen, Speltz, & Greenberg, 1998; Haapasalo & Tremblay, 1994; Keiley et al., 2003; Lahey et al., 1999; Patterson et al., 1989; Reiss et al., 1995; Shaw, Owens, Giovanelli, & Winslow, 2001; Shaw et al., 1998; Woodward, Taylor, & Downey, 1998)</p> <p>Low parental control, supervision, consistency, monitoring, and responsiveness (Bates, Petit, Dodge, & Ridge, 1998; Colder, Lochman, Wells, 1997; Haapasalo & Tremblay, 1994; Lahey et al., 1999; McCabe, Hough, Wood, & Yeh, 2001; Patterson et al., 1989; Shaw, Keenan, & Vondra, 1994)</p> <p>Intrusive parenting (DeKlyen et al., 1998)</p> <p>Family problems (Campbell, 1994; Haapasalo & Tremblay, 1994; Henry et al., 1996; Patterson et al., 1989)</p>
Environmental risk factors	<p>Stressful life events (Costello et al., 1988; Loss, Beck, & Wallace, 1995)</p> <p>Poverty (Keiley et al., 2000; McLeod & Shanahan, 1996; Nottelmann & Jensen, 1995)</p> <p>Peer rejection and neglect (Keiley et al., 2003; Patterson & Stoolmiller, 1991; Strauss, Frame, & Forehand, 1987)</p>	<p>Negative life events (Guerra, Huesmann, Tolan, Van Acker, & Eron, 1995; Keiley et al., 2003; Mac Kinnon-Lewis et al., 1994; Renken, Egeland, Marvinney, Mangelsdorf, & Sroufe, 1989)</p> <p>Poverty (Guerra et al., 1995; Keiley et al., 2003; Loeber et al., 2000a; McLeod & Shanahan, 1996)</p> <p>Peer rejection (Cole & Carpentieri, 1990; Coie & Dodge, 1988; Pope et al., 1991)</p> <p>Neighborhood violence (Guerra et al., 1995; Lahey et al., 1999)</p>

Table II. Child Factors Associated with Internalizing and Externalizing Symptoms

Internalizing	Externalizing
<i>Similar factors</i>	
Early temperamental traits of difficultness and irritability (Keiley et al., 2003)	Early temperamental traits of difficultness and irritability (Bates et al., 1998; Guerin, Gottfried, & Thomas, 1997; Keiley et al., 2003; Lahey et al., 1999)
General negative emotionality (Eisenberg et al., 2000; Joiner, Cantanzaro, & Laurent, 1996; Kovacs & Devlin, 1998; Lonigan, Carey, & Finch, 1994; Watson & Clark, 1984)	General negative emotionality (Eisenberg et al., 2000; Shaw et al., 2001)
Negative attributional and attentional biases (Bogels & Zigerman, 2000; McCauley, Mitchell, Burke, & Moss, 1988)	Hostile attributional and attentional biases (Dodge & Frame, 1982; Waas, 1988)
General psychosocial difficulties, poorer problem solving skills, deficits in academic and interpersonal functioning (Sacco & Graves, 1984; Strauss et al., 1987; Turner et al., 1987)	Deficient social skills and social-cognitive processes, poorer social problem solving skills (Calkins et al., 1999; Campbell, 1994; Dadds et al., 1996; Lochman & Dodge, 1994; Patterson et al., 1989; Sanders et al., 1992)
<i>Differentiating factors</i>	
Temperamental rigidity (Keiley et al., 2003)	Temperamental resistance to control (Keiley et al., 2003)
Behavioral inhibition (Eisenberg et al., 2000; Joiner et al., 1996; Kovacs & Devlin, 1998; Lonigan et al., 1994; Watson & Clark, 1984)	Lack of inhibitory control, impulsivity under controlled behavior (Eisenberg et al., 2000; Frick & Ellis, 1999; Henry et al., 1996; Lahey et al., 1999; Loeber et al., 2000b; Loeber & Keenan, 1994; Schachar & Logan, 1990)
Negative self-evaluations and self-schemas (Kendall, Stark, & Adam, 1990; Hammen & Zupan, 1984; Lonigan et al., 1994; Prieto, Cole, & Tageson, 1992; Sacco & Graves, 1984)	Poor emotion regulation, poor executive control, infant noncompliance (Eisenberg et al., 2000; Henry et al., 1996; Shaw et al., 1994; Shaw et al., 1998)
Low self-esteem (Messer & Beidel, 1994; Strauss et al., 1987)	Lack of empathy and guilt (Lahey et al., 1999)
Neuroticism (Kovacs & Devlin, 1998; Silberg, Rutter, & Eaves, 2001)	High activity level (Lahey et al., 1999)
	High sensation seeking, fearlessness, and callous-unemotional traits (Frick et al., 1999; Frick & Ellis, 1999; Lahey et al., 1999)
Increased somatic complaints (Turner et al., 1987)	Attention deficits (Eisenberg et al., 2000; Shaw et al., 2001)

children who were not able to establish peer relationships (Gazelle and Ladd, 2003). Further, high levels of general social avoidance in children has been linked with more pervasively impaired social functioning, lower social acceptance, and more failures in meeting social goals (Ginsburg, LaGreca, & Silverman, 1998; Rubin, Hymel, & Mills, 1989; Rubin, 1993; Stewart & Rubin, 1995; Wierzbicki & McCabe, 1988). These results suggest that the socio-developmental milestone of forming healthy relationships with others may play an important role in differentiating the persistence and severity of internalizing symptoms. Further, child avoidant behaviors may have important ramifications for later adjustment, such that children who are avoidant of peers may have fewer positive peer interactions and relationships and restricted opportunities for social interactions, resulting in reduced opportunities to learn and further refine social skills (Daleiden & Vasey, 1997; Ginsburg et al., 1998). This may prevent the development of effective coping responses and increase the likelihood of later interpersonal failures and internalizing symptoms (Daleiden & Vasey, 1997), re-

sulting in a cycle in which internalizing symptoms persist and worsen.

The behaviors of children with internalizing disorders (e.g., immature, dependent behaviors) also may increase the likelihood of negative interactions with others and their subsequent confirmation of initial negative expectations (Mesman & Koot, 2000). Accordingly, depressed children have been found to report poorer social skills (Kennedy, Spence, & Hensley, 1989) and deficits in intra- and extra-familial relationships that did not totally abate following remission of depression (Puig-Antich et al., 1985). Children's ratings of filmed depressed children suggests that children may respond negatively toward depressed peers, evaluating them as less likeable, less attractive, and as engaging in fewer positive behaviors. Rudolph, Hammen, and Burge (1994) found that, in a matched pair play situation, partners of depressed children reported that they liked playing with their peers less than partners of nondepressed children. Partners of depressed children were also less likely to report that they believed their partner enjoyed playing with them. Interactions in dyads

with a depressed child tended to be marked by more negative affect, conflict, and friction, and decreased collaboration and joint problem solving. These findings validate that children with internalizing disorders and high rates of internalizing symptoms may have difficulties forming healthy relationships with others.

Internalizing symptoms may also be associated with failure to attain the socio-developmental milestone of independence and autonomy from parents, particularly as the child reaches preadolescence. For example, behaviors of children with internalizing symptoms may be more negative, fearful, and inhibited, resulting in parental overinvolvement, and parental endorsement of avoidant strategies, which are likely to be associated with increases in child fearfulness, behavioral inhibition, and withdrawal (Rubin et al., 1989). This suggests that child anxious symptoms is likely to result in restricted opportunities for child initiation and exploration within his/her environment, which, in turn, is likely to reinforce the child's initial cognitions of the environment as threatening and of him/herself as relatively incompetent.

Externalizing Symptoms

The central feature of externalizing disorders, such as conduct disorder (CD), oppositional defiant disorder (ODD), and attention deficit hyperactivity disorders (ADHD), is "dysregulated behavior" (Kovacs & Devlin, 1998), which is likely to be associated with a child's capacity to self-reflect. Accordingly, a socio-developmental milestone that is hypothesized to play a preventive mediational role against the development of co-occurring internalizing symptoms is failure to self-reflect and self-evaluate. It is typically during middle childhood that children gain the skills to reflect on themselves and integrate information on how others may perceive them into their concept of self. As children reach this age period, if they are not able to "slow down" enough to reflect on themselves or incorporate feedback from others, they may not learn to self-evaluate and self-reflect.

The present paper proposes that factors associated with externalizing symptoms, such as illusory positive biases, impulsivity, poor executive control, and callous-unemotional traits may decrease the likelihood of the attainment of socio-developmental milestones of self-reflection and self-evaluation. For example, children with these attributes may be less

likely to notice negative responses by others to their behavior, not incorporating this feedback into their self-concepts. Therefore, failure to attain the socio-developmental milestones of self-reflection and self-evaluation may attenuate, or even eliminate, the negative impact that social and academic difficulties can have on the child's self-concept. In turn, this is proposed to play a preventive role against the development of co-occurring internalizing symptoms.

Specifically, it is proposed that illusory positive biases, impulsivity, poor executive control, and callous-unemotional traits play a mediational role between externalizing symptoms and the failure to attain the socio-developmental milestones of self-reflection and self-evaluation. In turn, it is proposed that these socio-developmental milestones play a mediational role between externalizing symptoms and the failure to develop co-occurring internalizing symptoms. To explore this issue, the paper will first summarize relevant research in the field, particularly in terms of associations between externalizing symptoms and impaired self-reflection and self-evaluation.

Risk Factors

As with internalizing disorders, child, environmental, family, and genetic factors have been shown to be associated with externalizing disorders (see Tables I and II) and play important roles in the development and maintenance of externalizing problems. Of these factors, the present model focuses on externalizing symptoms that may inhibit the development of self-reflection and self-evaluation. Therefore, review of externalizing symptoms will be limited to a discussion of externalizing symptoms that are relevant to deficits in self-reflectiveness.

Cognitive Processes

Research has demonstrated associations between externalizing symptoms in children and positive illusory self-perceptions (Baumeister, Smart, & Boden, 1996; Hoza, Pelham, Dobbs, Owens, & Pillow, 2002; Owens & Hoza, 2003; Zakriski & Coie, 1996). Positive illusory self-perceptions are evident when children overestimate their own competence and the supportiveness of others, and have been associated with increased aggression (Edens, Cavell, & Hughes, 1999; Hughes, Cavell, & Grossman, 1997) and severe hyperactivity and impulsivity (Owens & Hoza, 2003). In response to potentially threatening

information to an idealized self-concept (i.e., “threatened egotism”), a child may display aggressive behavior, which serves to defend and protect this positive illusory self-concept and resist downward changes (Baumeister et al., 1996; Edens et al., 1999; Hughes et al., 1997).

These biases may result from the failure to attain realistic views of self and are likely to inhibit the development of future realistic views of self. In this manner, it has been suggested that the aggressive behavior of some individuals serves to maintain their idealistic, positive self-concepts, particularly when faced with potentially threatening, incompatible messages from the environment (Baumeister et al., 1996; Edens et al., 1999; Hughes et al., 1997).

Further, cognitive processes in children with externalizing symptoms, such as hostile attributions and expectations, are likely to result in negative social interactions and experiences that reinforce and confirm initial negative cognitions (Dodge & Frame, 1982; Waas, 1988). In fact, it has been proposed that hostile attribution biases and cognitive distortions mediate aggressive peer interactions in children with ADHD (Coie & Dodge, 1988). Thus when children behave aggressively, in accordance with their hostile perceptions and impaired social processing abilities (Milch-Reich, Campbell, Pelham, Connelly, & Geva, 1999), they are likely to increase the negative perceptions they have of peers and that peers hold of them, making future social difficulties more likely.

Social Processes

Several aspects of externalizing symptoms, such as impulsivity, attention deficits, and undercontrolled behaviors are aversive to peers, teachers, and parents, and have a negative impact on socialization (Calkins, Gill, & Willford, 1999; Henry, Caspi, Moffitt, & Silva, 1996; Patterson, DeBaryshe, & Ramsey, 1989). In fact, the more a child has been perceived as deviant by peers, the greater she is likely to be rejected by them, especially if that child was perceived as responsible for his/her deviance (Juvonen, 1991).

Some researchers posit that children with externalizing symptoms, particularly those with high levels of inattention and immaturity (Cunningham, Siegel, & Offord, 1991; Landau & Milich, 1988; Pope, Bierman, & Mumma, 1991), do not how know to effectively approach and interact with peers, have deficient social skills and social-cognitive processes, and

display poorer social problem-solving skills (Calkins et al., 1999; Campbell, 1994; Dadds et al., 1996; Lochman & Dodge, 1994; Patterson et al., 1989; Sanders, Dadds, Johnson, & Cash, 1992). Additionally, aggressive and impulsive children may not notice subtle responses by others to their aggression and therefore may not be influenced by negative reinforcements for discontinuation of such behavior (Calkins et al., 1999). Further, such children may not appropriately change their behavior as dictated by the social situation (Cunningham et al., 1991; Landau & Milich, 1988), and may not incorporate negative feedback from others into their self-concept. This may portend difficulty in attaining the socio-developmental milestones of self-reflection and self-evaluation.

In sum, deficits in social skills, communication, and behavioral control seen in children with externalizing symptoms (Pope et al., 1991) that have been associated with peer rejection (Keiley et al., 2003; Patterson et al., 1989) are also associated with failure to attain the socio-developmental milestones of self-reflection and self-evaluation. These deficits may also decrease the likelihood of children adapting social norms from the larger peer group and lead to further social impairments and externalizing problems, particularly as aggressive-rejected children form friendships with other deviant and aggressive peers, reinforcing and maintaining original deviant behaviors and beliefs (Cairns, Cairns, Neckerman, Gest, & Garipey, 1988; Lahey et al., 1999; Patterson et al., 1989). In fact, some research has indicated that aggressive behavior combined with peer rejection may be a particularly powerful interaction for increasing risk of later impairment (Coie, Lochman, Terry, & Hyman, 1992; Dubow, 1988; French, 1988; Hecht, Inderbitzen, & Bukowski, 1998; Patterson et al., 1989).

Co-occurring Internalizing and Externalizing Disorders Research on Co-occurring Symptoms

The methodology and general results of research focusing on co-occurring symptoms is presented in Table III. There is a range in co-occurring patterns studied, such that some research has been focused on general, or broad co-occurrence (i.e., between general internalizing and externalizing), whereas other investigators have focused on more specific co-occurrences (e.g., depressive disorders and CD). Overall, studies tended to focus on middle-late childhood and preadolescence, with most studies

Table III. Studies of Heterotypic Co-Occurrence

Focus	Authors	N	Age	Sex	Sample type	Measures	Results
General internalizing and externalizing	Epkins (2000)	471	10–11	M, F	Community sample (389) and outpatient sample (82)	Used self-report of symptoms of depression (CDI) and anxiety (RCMAS) (1 SD above mean) and parent-report of CBCL externalizing scale score, ($T \geq 63$) to form pure, co-occurring, and no disorder groups	Pure internalizing and comorbid groups had sig. more negative cognitive processes than the pure externalizing and control groups
	Gjone and Stevenson (1997)	526 MZ, 389 DZ twin pairs	5–15	M, F	Norwegian birth registrar	CBCL Internalizing and Externalizing scales used to derive pure and co-occurring groups	Results indicate less genetic and more shared environmental influence in comorbid cases
ODD, CD, Anxiety, Depressive	Keiley et al. (2003)	585	K-8th grade	M, F	Longitudinal study	CBCL and TRF internalizing and externalizing scales resulted in pure and covarying internalizing and externalizing TRF scale scores in clinical level range ($T \geq 67$)	Found specific factors associated with pure and co-occurring cases
	Tolan & Henry (1996)	3647	1st–6th Grade	M, F	From public schools	TRF scale scores in clinical level range ($T \geq 67$)	Rates of comorbidity increase with age
	Frick et al. (1999)	143	6–13	M, F	Outpatients	DISC used to form composite index of symptoms, CBCL scales	CD/ODD children with high levels of callous unemotional traits show less trait anxiety and higher fearlessness
Depressive disorders and CD	Cole and Carpentieri (1990)	1464	7–13	M, F	from public schools	Self-report (CDI), peer-nomination, and teacher ratings of depression and CD symptoms	—a strong correlation was found between depression and conduct disorder, even after accounting for shared method variance by confirmatory factor analysis—the number of subjects who scored high on both depression and CD was higher than would be expected by chance alone
	Dadds et al. (1992)	73	7–14	M, F	Outpatients and controls	DSM-III-R diagnoses from KSADS-E of pure and mixed depressed and CD, and no disorder groups	High levels of depression in pure and mixed depressed children were associated with lower levels of family conflict and anger and displayed a noticeable absence of angry affect
	Kim et al. (2003)	897	10–12	M, F	Multi-site longitudinal study	Used DISC-IV to identify symptoms of depression and conduct disorder in children (1 SD above mean cut off) and form pure, co-occurring and no problem groups	Children with co-occurring problems uniquely reported sig. higher levels of parental hostility

Kovacs et al. (1988)	104	8-13	M, F	From a longitudinal study, most recruited through child outpatient clinics—depressed and controls	<i>DSM-III</i> diagnoses from ISC interviews of depressive disorders and CD	Comorbid CD was presented as a complication of depression and was unrelated to symptoms and course of depression, persisted after depression remitted, was equally distributed between genders, and was associated with poorer prognosis
Meller and Borchardt (1996)	56	Children and adolescents	—	Child and adolescent psychiatric inpatients who met criteria for depression	Used discharge diagnoses from medical records based on <i>DSM-III-R</i> criteria to form a depression + CD group and a depression w/o CD group	MDD + CD group- more common to have history of abuse, illegal behavior, and witnessing family violence, as well as a first degree relative with chemical dependency
Renouf et al. (1997)	161	8-13	M, F	Outpatients	<i>DSM III</i> criteria for depressive, CD, or comorbid, or other conditions	Having depression and conduct disorder predicts greater impairment in social competence than having only one or the other condition- the effect was additive
Sanders et al. (1992)	73	7-14	M, F	Outpatients and controls	<i>DSM-III-R</i> diagnoses from KSADS-E of pure and mixed depressed and CD, and no disorder groups	Mixed and depressed had high levels of depressed affect and low levels of angry affect whereas pure CD had both angry and depressed affect
Simic and Fombone (2001)	337	11-14	—	Outpatients	ICD-10 diagnoses of depressive conduct disorder (DCD), CD, and depressive disorder (DD)	DCD patients had less severe depression than the DD patients and had lower levels of aggression and violence and higher levels of depressive symptoms than the CD group - DCD patients had a more frequent history of abuse and parental hostility
Walker et al. (1991)	177	7-12	M	Longitudinal study from outpatient clinics	<i>DSM</i> diagnoses from DISC administered to teachers, parents, and children used to form pure and co-occurring anxiety and CD groups and no disorder group	Co-occurring group was deviant and had less disturbed social relationships than pure CD group
Ialongo et al. (1996)	415	1st Grade	M, F	From public schools	Self-report of anxiety (RCMAS) total score, teacher report of aggression (TOCA-R) standard score	Anxiety in the absence of aggression may serve as a protective factor against later aggression - boys and girls with comorbid aggression and anxiety were sig. more likely to be high in later aggression

Table III. Continued

Focus	Authors	N	Age	Sex	Sample type	Measures	Results
ADHD, Externalizing, Anxiety, and Depressive	Gabel et al. (1996)	246	6–11	M, F	Outpatients	CBCL internalizing and externalizing scales	Internalizing and externalizing behaviors were elevated in hyperactive boys and girls and comorbidity was related to the severity of the hyperactivity—Severe (but not mild) major depression sig. differed from psychiatric controls in the rates co-occurring disorders—almost all comorbid disorders preceded the onset of major depression
	Biederman et al. (1995)	424	—	—	Outpatients	Diagnoses from parent report on KSADS-E	Elevated levels of comorbid externalizing and internalizing symptoms are associated with greater ADHD symptom severity
	Connor et al. (2003)	300	M = 10.7 yrs	M, F	ADHD outpatients	DSM-IV diagnoses of ADHD; used parent report CBCL and teacher report TRF for comorbid symptoms	ADHD + anxiety or depressive disorder associated with sig. higher life stresses and parental symptoms than ADHD w/o anxiety or depressive disorder
	Jensen et al. (1993)	94	Average 8.5	M, F	Outpatients with ADHD, psychiatric controls, community controls	Used DSM-III diagnosis of ADHD—used self-report of symptoms of depression (CDI) and anxiety (RCMAS) and parent-report CBCL internalizing, and externalizing scores	Changes in CD over time was accompanied by corresponding changes in levels of comorbid symptoms
	Lahey et al. (2002)	168	7–12	M	Outpatients	DSM III, IIIR, and IV diagnoses from DISC interview at 7 different time points	Associations between parental and child internalizing disorders and between parental and child externalizing disorders were found, but associations across categories of disorder (i.e., internalizing and externalizing) were not
	Piffner et al. (1999)	177	7–12	M	Outpatients	DSM-III-R diagnoses from DISC administered to child and parent	Co-occurring group demonstrated sig. more socially aversive behavior than both of the pure symptom groups
	Rudolph et al. (1994)	161	7–13	M, F	From public schools and from a kids day camp	Used self-report of symptoms of depression (CDI) and anxiety (RCMAS) and teacher-report Conner's Abbreviated Teacher Rating Scale to form pure, co-occurring, and no disorder groups (used upper third as cutoff score)	One consequence of hyperactivity may be peer rejection, which may be related to internalizing problems or comorbidity may represent undifferentiated responding
	Weiss and Catron (1994)	350	3rd–6th Grade	M, F	From public schools	Used self-report of symptoms of depression (CDI), anxiety (RCMAS), aggression, and hyperactivity (YSR), teacher-report TRF scale scores, and peer reports of aggression and depression	

ADHD, Externalizing, Anxiety	March et al. (2000)	579	7-9	M, F	Multi-site treatment study of <i>DSM-IV</i> ADHD children	<i>DSM-III-R</i> diagnoses of anxiety and CD, <i>DSM-IV</i> diagnoses of ADHD to form groups of anxiety with CD and anxiety without CD	Elevated likelihood of diagnosis of anxiety disorder in the presence of CD
	O'Brien and Frick, 1996	132	6-13	M, F	Outpatients and controls from public schools	<i>DISC</i> interviews and <i>DSM-III</i> criteria used to form groups of conduct problems (CD or ODD), anxiety, and ADHD without conduct problems—clinic and normal control groups (CBCL T scores <67)	Children with CD exhibited reward-dominance response style only in the absence of a comorbid anxiety disorder and the presence of anxiety increases children's ability to inhibit reward seeking behavior in the presence of cues to punishment
	Pliszka (1992)	117	6-12		ADHD outpatients and public school controls	Structured interview used to assess <i>DSM-III-R</i> symptoms and child self-report of anxiety (RCMAS)	Children with both ADHD and anxiety were less impulsive and/or hyperactive than children with pure ADHD and showed fewer CD symptoms
ADHD and Anxiety	Perrin and Last (1996)	132	9-12	M	Patients with ADHD or anxiety and controls	<i>DSM-III-R</i> diagnoses	ADHD and anxiety appear to be independently transmitted in families

including children of both genders. Across studies, there has been a range of sample types (e.g., clinical and normative samples), informants (i.e., child-, parent-, or teacher-report) and measures used (e.g., *DSM* diagnoses, CBCL scores). Control groups with no disorders were present in some, but not all, studies. Further, some studies created independent variables based on diagnoses or clinically elevated symptom levels, whereas others used general symptoms levels as dependent variables. As illustrated by the diversity in study results, there have also been a wide range of study goals. For example, some studies explored genetic factors associated with pure and co-occurring symptoms (e.g., Gjone & Stevenson, 1997), while others explored non-genetic risk factors associated with pure and co-occurring cases (e.g., Keiley et al., 2003). As can be seen in Table III, these are just a few of the topics studied to date within the realm of co-occurrence. Based on this wide disparity of research goals and the associated difficulty in forming overarching conclusions, the results from these studies will be discussed in relevance to current theories of co-occurrence and the proposed model of co-occurrence as influenced by socio-developmental milestones.

Current Theories of Co-occurrence— Shared Features

Although levels of co-occurrence are highest within internalizing symptoms and within externalizing symptoms, considerable rates of co-occurrence are also evident between internalizing and externalizing symptoms (Verhulst & van der Ende, 1993). One theory of co-occurrence suggests that it may reflect nonspecific expressions of psychopathology in young children, with clearer presentation of psychopathology emerging as the child ages (Nottelmann & Jensen, 1995). Children lacking in cognitive maturity may also be likely to display nonspecific expressions of psychopathology. Another possibility is that co-occurring disorders in children represents undifferentiated responding (Weiss & Catron, 1994) that reflects the developmental stage of the child and base rates (i.e., joint probabilities) of internalizing and externalizing disorders during that period, with increased levels of co-occurrence during stages where specific types of externalizing and internalizing disorders are more prevalent (Biederman, Faraone, Mick, & Lelon, 1995; Nottelmann & Jensen, 1995; Thomas & Guskin, 2001; Tolan & Henry, 1996). Accordingly,

comorbidity of CD and anxiety disorders is highest during middle childhood and appears to decrease in adolescence. There is also an increased likelihood of comorbid depression and CD in preadolescence (Loeber & Keenan, 1994). Further, it has been proposed that prior to the developmental stage for typical emergence of a disorder, it may be represented by symptoms that are atypical, such that antisocial behaviors in children may represent “masked depression” (Kovacs et al., 1988; Kovacs, 1990). It is also possible that externalizing problems in children may overshadow more subtle depressive and anxiety symptoms (Hammen & Compas, 1994).

As seen in Tables I and II, many child, environmental, and family risk factors have been related to both internalizing and externalizing disorders (Keiley et al., 2003; Renouf, Kovacs, & Mukerji, 1997). Thus, another theory of co-occurrence is that shared risk factors may influence child disorders in a more general manner, such that co-occurrence might represent overlapping etiological processes or alternate expressions of the same disorder (Klein & Riso, 1993). For example, one explanation for these general associations is the role of negative affect and temperamental difficultness, which are salient in both internalizing and externalizing disorders (Keiley et al., 2003; Lahey, Loeber, Burke, Rathouse, & McBurnett, 2002; Lilienfeld, 2003). It is possible that family and environmental risk factors exacerbate stress in a child who is already predisposed to respond negatively, which, in turn, results in increased negative affect, with internalizing and externalizing symptoms merely reflecting different expressions of underlying negative emotionality and distress.

Some research suggests that children with co-occurring disorders have heightened maladjustment, such that co-occurrence is simply a reflection of a greater number of risk factors and/or more severe psychopathology. Accordingly, higher levels of child and environmental risk factors have been associated with an increased likelihood and severity of general psychopathology. For example, children with co-occurring affective and behavioral disorders have been found to have higher family rates of alcoholism, substance use, and antisocial personality, which may represent familial transmission of behavioral dysregulation (Kovacs et al., 1997). Additionally children with major depressive disorder and CD have been found to be more likely subjected to parental hostility, abuse (particularly physical abuse), witnessing family violence, and have a first-degree relative with substance addiction (Meller &

Borchart, 1996; Simic & Fombone, 2001). Further, children with ADHD and an internalizing disorder have shown significantly higher levels of life stress and maternal psychopathology (Jensen, Shervette, Xenakis, & Richters, 1993).

Related to the notion that co-occurrence represents more severe psychopathology, research on children with ADHD has found that increased severity of hyperactivity (Connor et al., 2003; Gabel, Schmitz, & Fulker, 1996) and the presence of co-occurring disorders (Munir, Biederman, & Knee, 1987) have been associated with higher levels of internalizing and externalizing symptoms. A similar pattern for increasing co-occurring symptoms with severe (vs. mild) depression has also been found (Biederman et al., 1995). Additionally, the presence of CD at any point in childhood has been associated with an increased rate of long-term functional problems in depressed children (Kovacs et al., 1988). Further, some research suggests that anxious children with conduct problems or aggressive behaviors may be more impaired than children without such behavior problems (Manassis & Hood, 1998). In another study, children with co-occurring anxiety and aggression were more likely to manifest high levels of later aggression than children with pure anxiety or aggression (Ialongo, Edelsohn, Werthamer-Larsson, & Crockett, 1996). Overall, children with co-occurring internalizing and externalizing symptoms have also been shown to have greater social impairments (Renouf et al., 1997; Rudolph et al., 1994; Wright, Zakriski, & Drinkwater, 1999), increasingly disordered relationships (Thomas & Guskin, 2001), more deviance, and higher rates of school failure (Wright et al., 1999).

In sum, some researchers suggest that there is considerable overlap between internalizing and externalizing disorders and propose that co-occurrence may simply reflect nonspecific expressions of psychopathology, undifferentiated responding, different manifestations of an underlying construct (e.g., negative affectivity), or heightened levels of risk factors and/or psychopathology. Some research supports the presence of shared risk factors for internalizing and externalizing problems and the contention that co-occurrence represents higher levels of risk factors and/or psychopathology.

Current Theories of Co-occurrence— Differentiating Features

Despite the frequency of co-occurring disorders, there are still pure cases in which co-occurring symp-

toms are not evident. A model in which similar child and environmental risk factors lead to the development of both internalizing and externalizing disorders fails to account for the large minority of cases in which heterotypic co-occurring symptoms do not emerge. Therefore, although there are some common features to both externalizing and internalizing disorders, a model focusing solely on shared features leaves many questions unanswered.

The notion that co-occurring symptoms represents a distinct pattern is supported by factor analyses that reveal a factor for externalizing, internalizing, and co-occurrence (Keiley et al., 2003), as well as by evidence that internalizing and externalizing disorders have been shown to co-occur at rates higher than expected by chance. This does not belie the fact that the presence of an externalizing disorder may affect the manifestation and course of a co-occurring internalizing disorder and vice versa. For example, co-occurring disorders have been shown to wax and wane in concert, such that increases or decreases in CD have been shown to be accompanied by changes in levels of associated internalizing symptoms and vice versa (Lahey et al., 2002). Additionally, CD has been found to affect the concurrent expression, severity, and later course of depressive symptoms and depression has been found to similarly affect delinquency (Beyers & Loeber, 2003), with some research suggesting stronger relations for the former (Capaldi, 1992; Wiesner, 2003).

Some child and environmental features that may differentiate between internalizing and externalizing disorders (see Tables I and II) include specific components of temperament (e.g., behavioral inhibition vs. impulsivity), parenting (e.g., high vs. low parental control), and child coping styles (e.g., avoidant vs. aggressive). For example, behavioral inhibition has been proposed to explain variation in the development of co-occurring externalizing symptoms, with children who show higher rates of passive avoidance and sensitivity to punishment expected to demonstrate fewer externalizing symptoms (Eisenberg, Fabes, Guthrie, & Reiser, 2000). In addition, ADHD with anxiety symptoms has been associated with lower impulsivity and higher behavioral inhibition than ADHD without anxiety (Pliszka, 1992). Further, specific risk factors have been identified for pure internalizing, pure externalizing, and co-occurring symptom patterns. For example, female gender and temperamental rigidity have been specifically associated with pure internalizing, whereas temperamental resistance to control, parental harsh punishment or aversive parenting, male gender, low

socioeconomic status, peer rejection, and lower temperamental rigidity have been specifically associated with pure externalizing symptoms (Dadds, Sanders, Morrison, & Rebetz, 1992; Keiley et al., 2003). Conversely, family stress and peer rejection have been associated with the expression of co-occurring symptoms (Keiley et al., 2003).

Additionally, genetic research provides inconsistent support for the view that co-occurrence simply reflects one underlying construct. Some investigators have found links between externalizing and internalizing disorders in clinic-referred children and their parents, suggesting that there is partial overlap of genetic liability for conduct problems and anxiety disorders. This overlap is thought to reflect general negative emotionality, neuroticism, and an associated proclivity toward negative life events (Hankin & Abramson, 2001). Conversely, research has also shown that genetic transmissions exist specifically between internalizing in children and parents and externalizing in parents and children, but not across categories (i.e., internalizing and externalizing) (Piffner et al., 1999). Similar results have been found in twin studies, with greater specificity found between internalizing disorders in twins or between externalizing disorders in twins than across categories. This suggests that shared environmental factors may be more influential in the development of heterotypic co-occurring disorders (Gjone & Stevenson, 1997). For example, Perrin and Last (1996) suggest that ADHD and anxiety appear to be independently transmitted in families. If co-occurrence reflects a general genetic predisposition that when coupled with other environmental risk factors, is associated with the presence of several disorders, then genetic transmissions across categories should be present.

Overall, despite considerable overlap, distinctions have been found between pure and co-occurring internalizing and externalizing in terms of risk factors and symptom presentation. Genetic research, albeit inconsistent, suggests that pure and co-occurring cases represent distinct disorders. In addition, the fact that the prevalence of co-occurring disorders occurs at above chance levels further suggests that co-occurrence represents a distinct phenomenon, with factor analyses supporting such a contention.

Current Theories of Co-occurrence— Reciprocal Processes

In explaining co-occurrence, some research has focused on the reciprocal interactions between chil-

dren and their environments, such that the development of an initial disorder is believed to have consequences on later interactions and adjustment that may result in risk for a second disorder (Angold & Costello, 1992; Biederman et al., 1995). For example, in Patterson and colleagues' (1989) dual-failure model, it is proposed that CD leads to academic failure and peer rejection, which is associated with increased risk for internalizing symptoms and involvement with deviant peers. Involvement with deviant peers is likely to reinforce antisocial behaviors and lead to continued academic failures, peer rejection, and internalizing symptoms. Thus, every step in this model is associated with heightened risk for social maladjustment, internalizing symptoms, and antisocial behavior. Research consistent with this model has shown lower self-esteem (Fergusson, Lynskey, & Horwood, 1996; Hinshaw, 1992) and academic achievement (Hinshaw, 1992) and higher peer rejection (Strauss, Lahey, Frick, Frame, & Hynd, 1988; Weiss & Catron, 1994) and anxiety symptoms (March et al., 2000) in children with persistent externalizing behavior problems. An association between peer rejection and subsequent development of internalizing symptoms has also been documented (French, 1988; Goodyer, Wright, & Altham, 1989; Keiley et al., 2003; Rubin & Mills, 1988; Weiss & Catron, 1994). Further, adverse life consequences associated with chronic antisocial behavior may give rise to recurrent state anxiety (Lilienfeld, 2003).

A similar process has been proposed for internalizing disorders. For example, depressive symptoms are proposed to be associated with the onset of conduct problems (Loeber & Keenan, 1994) and, in some cases, comorbid CD is presented as a complication of depression (Kovacs et al., 1988). Some children with internalizing symptoms, particularly those low on behavioral inhibition, may respond to negative cognitive biases and attributions through increased aggression and antisocial behavior, dealing with their anxiety by acting out rather than worrying (Manassis & Hood, 1998). In addition, the negative affect and neuroticism that is associated with internalizing disorders may be annoying or irritating to others, having negative effects on relationships with parents, teachers, and peers. This may result in conflictual relationships with others, peer rejection, and lead to affiliation with deviant peers, particularly among children with lower levels of behavioral inhibition. These consequences may influence the development of co-occurring externalizing symptoms. Negative emotionality seen in internalizing disorders may also be associated with anxiety,

guilt, and overcontrol of impulses, which may lead to chronic antisocial behavior (i.e., “neurotic psychopathy”; Lilienfeld, 2003). Further, children with depression may have a lower threshold for stressful situations, poor judgment (Jensen, Burke, & Garfinkel, 1988), and impaired concerns about the adverse consequences of their actions, also resulting in increased risk for antisocial behaviors (Lilienfeld, 2003). Thus, some features of internalizing symptoms may be associated with the development of externalizing problems.

In sum, some features of externalizing have been associated with academic and social difficulties which, in turn, may be associated with internalizing symptoms. Similarly, some features of internalizing have been associated with negative affect and social difficulties, which may be associated with externalizing symptoms. Researchers have proposed reciprocal cycles to explain the process through which internalizing or externalizing symptoms results in development of heterotypic co-occurrence.

Proposed Role of Socio-Developmental Milestones

The prior theories of co-occurrence provide explanations for the presence of heterotypic co-occurring symptoms in childhood, focusing on shared and differentiating features and the potential role of reciprocal processes between children and their environments. Based on the theories of shared risk factors, undifferentiated responding, and reciprocal patterns, a child demonstrating behavior problems would be expected to show both internalizing and externalizing symptoms. However, theories of differentiating risk factors suggest that some symptoms may be associated only with internalizing or externalizing symptoms. The question that remains to be answered is why some children do not develop co-occurring disorders. The present model addresses the question of co-occurrence from a different angle, focusing on why co-occurrence may not emerge. As stated by Hammen and Compas (1994), “comorbidity is the rule rather than the exception,” yet few models have attempted to explain contexts when this rule should be expected to be broken. The present model does this by drawing attention to the role of socio-developmental milestones, specifically children’s failure to achieve them, as potential moderators of co-occurrence.

As mentioned earlier, the presence of internalizing or externalizing symptoms can place children in a reciprocal process whereby maladaptive cogni-

tions and behaviors are reinforced, maintained, and intensified. At the same time, it is proposed that these factors also place some children at risk for a failure to attain socio-developmental milestones (e.g., relationships with others, self-reflection) which, paradoxically, may prevent the development of co-occurring heterotypic symptoms (see Figs. 1 and 2). Accordingly, the child is simultaneously placing him/herself at increased risk for persistence of initial symptoms but at the same time, decreasing the probability of risk for co-occurring symptoms.

Internalizing

In the case of a “pure” internalizing disorder, it is proposed that high anxiety, coupled with high behavioral inhibition, may result in withdrawal and avoidance, which may maintain and intensify original internalizing symptoms while also reducing the likelihood of the child developing externalizing symptoms (Seligman & Ollendick, 1998; see Fig. 1). High levels of depression and negative affect may also be associated with withdrawal and avoidance. Further, temperamental rigidity (i.e., resistance to change), that has been specifically associated with pure internalizing symptoms (Keiley et al., 2003), may result in negative expectations and avoidant response styles that are unaffected by disconfirming information, such that these expectations and behavior patterns are likely to become chronic and pervasive.

Consistent with this theory and as described in the prior review, internalizing symptoms have been associated with elevated rates of withdrawal and avoidance (Wright et al., 1999) and increased time spent in solitary activities (Coie & Dodge, 1988). These avoidant and isolative behaviors, in turn, are hypothesized to lead to peer neglect (Coie & Dodge, 1988) or rejection (Rubin & Mills, 1988). Accordingly, a child who is withdrawn from his/her peers is unlikely to attain the socio-developmental milestone of forming and maintaining healthy peer relationships and incorporating such relationships into a view of self. This lack of involvement with peers is likely to prevent involvement with deviant peers, reducing the child’s opportunities for engaging in deviant behavior. These avoidant interactional styles are also likely to influence interactions with other areas of the environment, creating a context in which opportunities for deviance are severely, if not entirely, restricted. In fact, anxiety-disordered children have been found to be more likely socially neglected than both non-referred children and children

with CD (Strauss et al., 1988), and neglected peer status has been associated with low or nonexistent levels of aggression in boys (Coie & Dodge, 1988).

There have been several studies that provide support for an association between heightened anxiety and behavioral inhibition and decreased levels of externalizing symptoms, including aggression (Keiley et al., 2003; Wright et al., 1999). The protective role of behavioral inhibition has also been corroborated by Lahey and colleagues (1999), with results suggesting a negative association between behavioral inhibition and later levels of antisocial and aggressive behavior. Further, French (1988) found that, when compared to aggressive children, non-aggressive children were characterized by behavioral inhibition and high self-control (French, 1988).

Anxiety has been shown to moderate the severity of disruptive behavior (Russo & Beidel, 1994). For example, abstinence from externalizing behaviors in boys is rare, such that boys who abstain from externalizing behaviors are described as anxious, inhibited, tense, shy, and socially impaired (Moffitt, Caspi, Dickson, Silva, & Stanton, 1996). Overall, the presence of anxiety has been associated with a lower risk for or seriousness of CD (Loeber and Keenan, 1994), lower sensation seeking (Russo et al., 1991), lower levels of hostility (Rudolph et al., 1994), lower peer ratings of "meanness" and fighting, and fewer school suspensions and police contacts (Walker et al., 1991). Similarly, anxiety in children with attention deficit disorders has been associated with lower impulsivity, fewer and less severe externalizing symptoms, and a lower likelihood of CD (Biederman, Newcorn, & Sprich, 1991; Jensen, Martin, & Cantwell, 1997; Pliszka, 1992). Further, some children with conduct problems exhibit a reward dominant response style, which has been associated with antisocial disorders only in the absence of a co-occurring anxiety disorder (Ialongo et al., 1996; O'Brien & Frick, 1996).

Overall, this research indicates that, for some children, the presence of anxiety is associated with a decreased likelihood and severity of externalizing symptoms.

Similarly, depression in children with CD is associated with significantly lower levels of angry affect and coercive and oppositional behavior (Dadds et al., 1992; Sanders et al., 1992). It is possible that depressed children tend to use distressed behaviors, as opposed to angry, oppositional behaviors, to avoid or escape open conflict (Sanders et al., 1992). This

avoidant style may generalize to interactions outside the family context, effectively reducing externalizing symptoms, such as oppositionality and aggression, while also preventing the formation of relationships with others, particularly peers. In fact, extremely depressed children have been shown to display high levels of isolative behaviors and social withdrawal (Rubin, 1993).

In sum, research suggests that some internalizing symptoms (e.g., anxiety) are associated with a decreased likelihood and severity of externalizing symptoms. As internalizing symptoms, particularly high levels of anxiety, behavioral inhibition, and negative affect, are associated with increased avoidance and withdrawal, it is hypothesized that they are also associated with a failure to form close and meaningful relationships with others. The failure to interact with peers is postulated to restrict opportunities for deviant behavior (i.e., affiliation with deviant peers) and the development of peer-mediated antisocial activities (see Fig. 1).

Externalizing

In the case of "pure" externalizing disorders, factors associated with externalizing disorders, such as high impulsivity, hyperactivity, poor executive control, and positive illusory biases may impede development of the socio-developmental milestones of self-evaluation and self-reflection (see Fig. 2). Although children with externalizing symptoms are likely to face adverse social and academic consequences for their impulsive, deviant, and aggressive behaviors, without attaining the socio-developmental milestone of self-evaluation and self-reflection, these children are unlikely to "slow down" sufficiently to incorporate environmental feedback into their sense of self and overall feelings of esteem. Consistent with this perspective, research has found that children with ADHD have lower rates of anxiety disorders and social withdrawal and higher levels of impulsivity and conduct disorder than children with attention deficit disorder without hyperactivity (Lahey & Carlson, 1991; Lahey, Schaugency, Strauss, & Strauss, 1984; Lahey, Schaugency, Frame, & Strauss, 1985; Lahey, Schaugency, Hynd, & Carlson, 1987; Pliszka, 1989; Pliszka, 1992). This suggests that, for some children, the presence of hyperactivity may be associated with an increased likelihood of further externalizing symptoms and

a decreased likelihood or severity of internalizing symptoms.

A link also has been suggested between positive idealized self-concepts and externalizing disorders. Although externalizing symptoms are frequently associated with low self-esteem (Fergusson et al., 1996; Hinshaw, 1992), a subgroup of children with externalizing symptomatology seems to display positive illusory biases. These biases may result from the failure to attain realistic views of self and are likely to inhibit the development of future realistic views of self. Accordingly, it has been suggested that the aggression of some individuals serves to maintain their idealistic, positive self-concepts, particularly when faced with potentially threatening, incompatible messages from the environment. In fact, once depressive symptoms are accounted for, ADHD boys have been found to have self-concepts that were equal to, or more positive, than that of controls (Hoza, Pelham, Milich, Pillow, & McBride, 1993). Epkins (2000) also found significantly more negative cognitive processes in pure internalizing and comorbid cases than among pure externalizing cases, suggesting a specificity of negative cognitions to internalizing symptoms.

In sum, it is hypothesized that for some externalizing children, high levels of impulsivity, hyperactivity, poor executive control, or idealized self-concepts are likely to maintain and intensify externalizing symptoms, while also resulting in a decreased likelihood for the development of internalizing symptoms. It is proposed that high levels of these factors will have an attenuating effect on the development of co-occurring internalizing symptoms. The presence of these factors is proposed to prevent the attainment of the socio-developmental milestones of self-reflection and self-evaluation. Without attaining these milestones, a child's self-concept and overall mood is likely to be less affected by potential negative consequences of externalizing symptoms, resulting in a decreased likelihood of internalizing symptoms.

Congruent with this proposed theory, and in contrast to the theory that heterotypic co-occurrence merely reflects increased severity of psychopathology, some research suggests that children with single disorders may actually be more seriously affected and impaired than children with heterotypic co-occurring disorders (Lilienfeld, 2003). For example, Simic and Fombone (2001) found elevated severity of anxiety and overall depression in a group of children with depressive disorder when compared to children with "depressive conduct disorder" and

higher severity of overt aggression, destructiveness, and violence in a group of conduct disordered children when compared to the children with "depressive conduct disorder." Similarly, children with co-occurring CD and anxiety disorder have been found to be less deviant and less aggressive than children with CD in the absence of high levels of anxiety (Frick & Ellis, 1999; Walker et al., 1991).

Different researchers use different means to define maladjustment, which may in part account for why only some researchers find that co-occurrence is linked with greater severity of disorder (Munir et al., 1987; Pliszka, 1992). Children with both internalizing and externalizing symptoms are likely to have a wide range of symptoms, and therefore more overall symptoms that result in impairment in many different facets of their life. Children with pure internalizing or externalizing disorders by definition will have fewer overall symptoms and more specific clusters of symptoms. It is possible that children who do not have co-occurring cases may have very severe pure cases of disorder, the ramifications of which should not be overlooked. In this manner, co-occurring disorders may not necessarily represent greater severity and two disorders may at times be less severe or incapacitating than one (Lilienfeld, 2003).

Conclusions and Implications for Future Research

The present model may have important implications for the understanding of pure and co-occurring internalizing and externalizing disorders in children. A greater understanding of these disorders, in turn, is likely to improve prevention and treatment efforts. As co-occurring conditions may influence the course of disorder and responsiveness to treatment, studies of the etiology or treatment of internalizing and externalizing symptoms in children should account for co-occurrence (Verhulst & van der Ende, 1993). For example, children with co-occurring and pure symptoms have shown different responses to treatment (Pliszka, 1989), and children with co-occurring symptoms may benefit from different or more comprehensive treatment than interventions designed for pure symptoms (Russo & Beidel, 1994).

As highlighted in the present paper, there is a dearth of research that has focused on co-occurring symptoms in childhood, with studies often excluding participants with co-occurring disorders or failing to examine the potential role of co-occurring symptoms within their sample. It is likely that a

significant proportion of children in studies of internalizing also had externalizing symptoms that were unaccounted for and vice versa. The relatively small number of cases with pure symptoms and diagnoses poses a challenge for researchers focusing on pure expressions of disorder. Additionally, the scant body of research in this area makes it difficult to draw definitive conclusions regarding the development and outcomes of children with pure versus co-occurring internalizing and externalizing symptoms. Therefore, the field would benefit from studies assessing the development and adjustment of children with pure internalizing, pure externalizing, and co-occurring conditions. Longitudinal designs would be particularly informative as they could assess changes in symptoms over time. For example, children with high levels of social anxiety and withdrawal at one point in time are likely to be very different than children with consistently high levels of social anxiety and withdrawal. The present model focuses on the latter group; children who have consistently high levels of specific internalizing or externalizing symptoms.

Limitations of the Proposed Model

Although the current model focusing on the failure to develop socio-developmental milestones may offer insights into the question of why some children do not develop co-occurring symptoms, it may be limited in terms of its generalizability to girls, adolescents, and adults. For example, most of the co-occurring literature has been focused on boys. Thus, little is known regarding the development of childhood externalizing symptoms in girls, partly because of the relatively low levels of such symptoms during childhood in females. Some research indicates that early levels of externalizing symptoms in girls are more severe than in boys, with higher rates of co-occurring disorders and significantly worse later adjustment (Loeber & Keenan, 1994). However, other research suggests that there are higher rates of co-occurring externalizing and internalizing disorders in boys (Keiley et al., 2003). The present model may not explain potential gender differences in co-occurrence or why girls with early externalizing symptoms may or may not be more likely to develop co-occurring symptoms than boys. Based on cultural differences (e.g., social norms and socialization processes) and differences in friendship patterns (e.g., close interpersonal friendships vs. group

attachments) (Zoccolillo, 1993), it is possible that girls may be more prone to internalizing disorders and less likely to develop externalizing problems in the presence or the absence of internalizing symptoms. It is also possible that early co-occurring disorders in males and females may represent different constructs, each with specific implications for later adjustment. An integrated model that can account for potential gender differences is of import, but will be difficult to formulate until research provides more of a focus on externalizing symptoms in girls and a greater focus on co-occurring symptoms in general.

The present model is also specific to childhood and may not account for developmental changes at puberty or factors of importance during adolescence and adulthood. Therefore, the model may have limited generalizability to adolescents and adults. Although it may explain the development, or lack thereof, of co-occurring internalizing and externalizing symptoms in childhood, its utility may be limited in understanding such co-occurring symptoms throughout the rest of the life span. Therefore, future models that provide a life-span perspective are also needed.

Further, the possibility remains that alternate explanations may account for the presence, or absence, of heterotypic co-occurring symptoms in children. The inconsistency of results in this area suggests that the field would benefit from clarification of the potential role of genetics in co-occurring heterotypic symptoms in children. It is possible that genetic factors may play a greater role in co-occurrence than is presently understood. Thus, further twin, adoption, and familial loading studies of pure and co-occurring externalizing and internalizing symptoms in children would be of benefit. It is also possible that for a small subgroup of children, co-occurring internalizing and externalizing disorders may reflect increased severity of psychopathology, particularly in children with early onset, more risk factors, fewer child resources, narrower range of coping skills, and more family disorganization. Accordingly, Kovacs and Devlin (1998) suggest that depression preceded by CD is the result of environmental factors, as proposed by the dual-failure model, but that concurrent early emergence of depression and CD may represent diminished child resources, such as poor emotional and behavioral regulation.

In terms of environmental precipitants, research has found that children who experienced extremely stressful life events (Keiley et al., 2003) or children

with extremely high levels of parental hostility (Kim et al., 2003) showed higher co-occurrence of externalizing and internalizing symptoms as opposed to pure disorders. Concurrent anxious, withdrawn behaviors coupled with disruptive, aggressive behaviors may be particularly annoying and disconcerting for peers, teachers, and parents (Keiley et al., 2003), and may result in poorer interactions and relationships with others, reducing potential socialization, and likely reinforcing and intensifying original symptoms. Thus, children with concurrent emergence of co-occurring symptoms may both experience and elicit more stress and hostility from the environment. Regarding sequential emergence of co-occurring symptoms, some research suggests that delinquency affects depression more than depression affects the course of delinquency (Beyers & Loeber, 2003), suggesting that the specific sequential ordering of onset may be of import to expression, course, and outcome of disorder. There is a significant dearth of research examining concurrent versus sequential onset of internalizing and externalizing disorders in children (Nottelmann & Jensen, 1995) and much more longitudinal research needs to be done on this topic to inform models of co-occurrence in children.

In addition, it is also assumed that factors other than socio-developmental milestones may play a role in the development of co-occurring symptoms and disorder. For example, biological and neurological factors may affect the development of internalizing and externalizing disorders in children. Heim and Nemeroff (1999) found differences in central corticotropin-releasing factor (CRF) hyperactivity and increased stress reactivity as a result of early life stress. It has been suggested that early life stresses, coupled with genetic predisposition, may result in neurobiological vulnerability to stress and lower thresholds for developing depression and anxiety in the presence of stressors. Additionally, in relation to Patterson's dual-failure model, it is possible that other child factors may provide protection from negative consequences associated with antisocial behavior, such as peer rejection and academic failure. For example, Edens et al. (1999) found a subgroup of aggressive children who had higher self- and other-reported support and relationship quality, suggesting that aggression in some children is not necessarily associated with peer rejection or troubled relationships with others. It is possible that some factors (e.g., intelligence, physical attractiveness, a good sense of humor) may be able to at least partly compensate for the negative effects of aggressive and an-

tisocial behavior, promoting the attainment of socio-developmental milestones (e.g., healthy relationships with others, self-evaluation, self-reflection). Further, some aggressive children have been found to be controversial in peer social status (rather than rejected), liked by some peers and disliked by others. Children with controversial peer status have been shown to be relatively happy and comfortable with peer relationships (Crick & Ladd, 1993). Thus, although these children are rejected by some peers, acceptance by other peers may be protective against the negative affectivity that may typically accompany peer rejection.

Further, another potential contributor to maintenance and intensification of externalizing symptoms is callous-unemotional traits. These traits are seen in some children with antisocial behavior problems and are likely to prevent the attainment of empathy toward others and self-reflection. Some researchers propose that there is a link between anxiety and callous-unemotional traits, such that the presence of callous-unemotional traits is proposed to suppress the development of internalizing symptoms (i.e., anxiety, distress) and is also associated with factors placing the child at risk for future externalizing behaviors, such as impulsivity, lack of behavioral inhibition, and fearfulness (Frick & Ellis, 1999; Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999). In fact, children with ODD or CD who also displayed callous-emotional traits were more aggressive and oppositional than ODD or CD children without these traits (Frick & Ellis, 1999).

It is also possible that differences in internalizing or externalizing symptoms may confer a greater or lesser risk for co-occurring heterotypic symptoms. For example, reactive versus proactive aggressors may differ in their likelihood to develop internalizing symptoms and course of disorder (Ialongo et al., 1996). Similarly, children with anxiety disorders may be more likely to engage in covert antisocial behavior rather than aggression (Kazdin, 1992). Research elucidating the potential role of these differences in the development of co-occurring symptoms would be beneficial. Further, the present model is based on subtle distinctions among children with internalizing and/or externalizing symptoms (e.g., levels of behavioral inhibition or levels of impulsivity) and research designs that do not account for distinctions in behavior patterns among children may fail to find existing relationships and patterns between internalizing, externalizing, and co-occurring symptom patterns.

CONCLUSION

In sum, we propose that the failure to attain socio-developmental milestones may prevent the development of a heterotypic co-occurring disorder in childhood for a subset of children in which such milestones are relevant. Further research is needed to differentiate between children who do and do not develop co-occurring disorders. As research has demonstrated similarities and differences in risk factors associated with internalizing and externalizing disorders, with some research suggesting that co-occurrence represents heightened severity of risk factors, studies examining the interaction of child factors relevant to the proposed model (e.g., inhibition, impulsivity) and family risk factors would be particularly informative. Overall, studies assessing the potential efficacy of this model may be of potential clinical value in terms of elucidating processes involved in the development of internalizing, externalizing, and co-occurring disorders in children.

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