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Separation Anxiety and Oppositional Defiant Behavior: Perceived Comorbidity Resulting from
Ambiguous Behavioral Items

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Abstract

We examined whether ambiguous behavioral items contribute to the perceived co-occurrence between separation anxiety (SA) and oppositional defiant (OD) problems. In Study 1, 72 mothers of 7 to 10 year old children (56% male) read descriptions of children displaying either SA or OD behaviors and then rated the children on items categorized by judges as ambiguous or unambiguous representations of SA and OD problems. For both SA and OD scenarios, mothers endorsed ambiguous behavioral items describing the non-presented problem more often than unambiguous behavioral items of the non-presented problem. In study 2, parents ($N = 201$) and 12 to 17 year old clinic-referred youth (67% male) ($N = 177$) completed the Child Behavior Checklist (CBCL) and Youth Self Report (YSR), respectively. Scales were created using only the items from these measures judged as unambiguous indicators of SA or OD problems. For parents, the unambiguous SA and OD item scales were significantly less correlated with each other than were the syndromes or DSM-oriented scales of the CBCL. Item ambiguity had less effect on youth self-ratings. Results indicate that some comorbidity between SA and OD behaviors may be explained by ambiguous behavioral items. Implications for assessing and understanding the co-occurrence of SA and OD problems in children are discussed.

Keywords: parent ratings; separation anxiety; oppositional; comorbidity

Separation Anxiety and Oppositional Defiant Behavior: Perceived Comorbidity Resulting from Ambiguous Behavioral Items

Clinicians and researchers rely heavily on adult reports in assessing childhood problems. Unfortunately, this reliance can complicate the assessment process in a number of ways, including a lack of agreement among different raters or potential biases in the ratings (Achenbach, McConaughy, & Howell, 1987; De Los Reyes & Kazdin, 2005). Characteristics of the measures used to gather parent and teacher reports also may confound the assessment. In this paper, we consider the possibility that some items included on common childhood checklists are ambiguous and may spuriously increase the perceived co-occurrence or comorbidity of child problems in parental reports. While the term comorbidity often refers to the presence of more than one diagnosis occurring in an individual at the same time, we use it in this paper interchangeably with co-occurrence to reflect the overlap of childhood behavior problems more broadly defined. Similarly, given our focus on the ambiguity of items used in common parent-report checklists, rather than on specific diagnostic criteria for the disorders, we use the term problem, rather than disorder, to reflect a broad characterization of these conditions.

This research examines parental perceptions of two common problems occurring in early childhood: separation anxiety (SA) and oppositional defiance (OD), and the influence of ambiguous behavioral items on their perceived comorbidity. SA is characterized by excessive anxiety, particularly concerning separation from the home or attachment figures. SA is the only anxiety problem described as specific to childhood and is estimated to occur in 2 to 13% of young children (Costello & Angold, 1995). OD behavior, characterized by disobedience, defiance, and hostility towards authority figures, also is most common in early childhood and is estimated to affect between 2 to 16% of youth (American Psychiatric Association, 2000).

As indicated, both SA and OD behaviors are relatively prevalent in childhood, however, their comorbidity exceeds what would be predicted from the base rates. For example, using DSM diagnostic criteria, studies reveal odds ratios between OD disorder (and/or conduct disorder) and child anxiety disorders that range between 3.1 and 5.4 (Angold, Costello, & Erkanli, 1999; Ford, Goodman, & Meltzer, 2003). Most recently, the Methods for the Epidemiology of Child and Adolescent Mental Disorders study, with youth 9 to 17, reported the odds ratio between OD and SA disorders as 3.36 (Marmorstein, 2007).

This epidemiologically demonstrated comorbidity is somewhat at odds with many of the theoretical accounts of the etiologies of these two types of problems – accounts which would suggest little comorbidity. For example, biological theories used to explain both oppositional and anxious behaviors, such as the Behavioral Inhibition/Activation Systems or Hypothalamic Pituitary axis/Fearlessness theories (Gray, 1994; van Goozen, Snoek, Matthys, van Rossum, & van Engeland, 2004), often suggest that the underlying biological processes of SA and OD behaviors are different, and perhaps even in opposition to each other. Social learning explanations of the origins of SA and OD also tend to emphasize different variables. Social learning explanations for SA focus on over-controlling and over-protective parenting (Hudson & Rapee, 2002), in contrast to the permissive, inconsistent or harsh parenting that is most often causally linked to child OD behaviors (Patterson, 1982). Even with different etiologies, it might be argued that the comorbidity of SA and OD behaviors arises because having either of the problems increases the risk for the other. For example, Frick, Lilienfeld, Ellis, Loney, and Silverthorn (1999) hypothesized that oppositional behaviors give rise to anxiety, as children are confronted with family conflict and academic problems. However, this possibility suggests a temporal ordering of oppositional and anxious behaviors that is not always found. For example,

Mason et al. (2004) found that childhood OD behavior did not predict anxiety disorders in adulthood, instead adult anxiety was related to childhood shyness and inattention. Similarly, the strongest predictors of adult violence were childhood oppositional and conduct problems, and childhood anxiety actually inhibited violence in adulthood.

In reviewing the co-occurrence of internalizing and externalizing child behaviors generally, Lilienfeld (2003) outlined two broad classes of explanation for the comorbidity: 1) methodological explanations such as referral biases or instrumentation issues and 2) substantive explanations such as common etiological processes or underlying mechanisms (for a more detailed review the reader is referred to Lilienfeld, 2003). Given the evidence reviewed above, we argue that substantive explanations for the comorbidity between OD and SA behaviors are insufficient and that methodological explanations for the overlap also need to be considered. In particular, we consider overlap between the behaviors used to characterize OD and SA problems in children.

One cause of overlap between disorders that has been previously explored is the so called “halo bias.” This is an effect that has been shown in numerous studies in which the presence of particular types child behavior affects parent and teacher perceptions and ratings of co-occurring, but different behaviors (e.g., Jackson & King, 2004; Schachar, Sandberg, & Rutter, 1986; Stevens, Quittner, & Abikoff, 1998). These studies have typically focused on behavioral ratings of co-occurring hyperactive and oppositional behaviors, and have generally found that the presence of oppositional behavior results in increased ratings of hyperactive behaviors related to when the hyperactive behaviors are presented in isolation.

Ambiguity of items on behavioral rating scales may also increase the perceived occurrence or comorbidity of behaviors. In the case of OD and SA, many of the behaviors

characteristic of these problems are clearly and specifically associated with their respective conditions, and some behaviors are likely to be true characteristics of both disorders. However, there are other behaviors that appear to be more ambiguous in nature, often appearing quite context specific, which might be categorized as related to either SA or OD problems depending on the situation in which they occur (Garland & Garland, 2001; Marmorstein, 2007). These include internal experiences such as feeling unloved, as well as more overt behaviors, such as crying or arguing. These ambiguous or context-specific behaviors may increase the co-occurrence of SA and OD problems in parents' ratings of child behavior. As an example, consider a child who has frequent temper tantrums. The tantrums could reflect SA problems if their purpose is to prevent parents from leaving the child. However, the tantrums also may be characteristic of OD problems; especially if they occur in the context of the child refusing to comply with parental instructions. When the parents of this child complete a rating scale such as the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001), they will indicate that temper tantrums are a frequent problem, but this rating will be ambiguous as to whether the tantrums reflect SA or OD problems. If the child's tantrums are related to SA, they will be erroneously counted as an OD behavior on the CBCL rather than reflecting the anxiety related to SA. It also is possible that children who are oppositional may be perceived as anxious, such as when a child cries to avoid completing a task. Similar to the temper tantrum in the first example, on many parent rating scales crying would be counted as characteristic of anxiety problems, rather than as oppositional behavior. Although by using contextual information and exclusionary criteria, skilled clinicians and nosological systems such as DSM are able to distinguish between such behaviors, common parent rating scales do not typically make the distinctions clear. Thus,

we argue that items on parent rating scales that are ambiguous in the absence of any context may contribute to inflated comorbidity between SA and OD behaviors.

The role of ambiguous items in generating a perceived co-occurrence between SA and OD problems may be characterized as a more specific example of negative halo effects or biases. As noted above, a negative halo bias occurs when the presence of one type of child problem influences leads to elevated ratings of a variety of other problems (Abikoff, Courtney, Pelham, & Koplewicz, 1993; De Los Reyes & Kazdin, 2005). Such negative halo effects are more likely to appear in ratings of ambiguous behaviors where there is more room for subjectivity in parent ratings. In this paper, we distinguish the biases or confusions that may be specific to ambiguous depictions of SA or OD problems from more general negative halo effects that may occur in parent ratings of any type of child behavior.

Finally, the influence of item ambiguity may be a more substantial problem in ratings obtained from parents or teachers, than in self-ratings by children given children's insight into their own internal states and motivations, especially with regard to internalizing problems such as anxiety. For example, a child who frequently cries to avoid following parental directions, may still be unlikely to endorse crying as something that is a problem for him or her. Consistent with this argument, Foley and colleagues (2004) found that when SA disorder was diagnosed on the basis of a child interview, it was comorbid with parents' but not children's reports of oppositional behavior.

The Present Study

The present research is comprised of two studies. We began by using expert judgments to place behavioral items from commonly used parent-report measures of child oppositional and anxious behavior into four categories: Unambiguous Separation Anxiety (USA), Ambiguous

Separation Anxiety (ASA), Unambiguous Oppositional Defiance (UOD), and Ambiguous Oppositional Defiance (AOD). The USA category included items considered to be clear exemplars of SA problems, such as “clings to adults or too dependent,” whereas the ASA category included items that would be expected in children experiencing SA problems, but that also might occur in children with OD problems, such as “cries a lot.” Without knowing the context of these ambiguous behaviors, it would not always be clear that they represent SA problems. Conversely, the UOD category included exemplars of OD problems, such as “often blames others for his/her misbehavior,” whereas the AOD category included items characteristic of OD problems but that also may occur in children with SA problems, such as “demands a lot of attention.” Again, without context these behaviors would not necessarily be seen as oppositional.

The first study used written scenarios to describe children displaying both Unambiguous and Ambiguous behaviors consistent with either SA or OD problems. Mothers read the scenarios and rated the children on all the SA and OD behaviors. We expected, of course, that mothers would rate the behaviors (both ambiguous and unambiguous) consistent with the presented scenario as more descriptive of the child than the behaviors (ambiguous and unambiguous) that were not presented. However, we expected that the ambiguous behaviors would be endorsed as being less descriptive than the unambiguous behaviors despite both being presented equally in the scenario. In addition, and most importantly, the ambiguous behaviors that were not presented within the scenario (i.e., those characteristic of the other problem) would be endorsed more often than the unambiguous exemplars that were not presented. Finally, to test for the possibility of a general negative halo effect, we examined whether mothers were more likely to endorse other types of problems (specifically somatic symptoms) among children portrayed with either SA or OD behaviors. The use of the somatic symptoms allows for a differentiation between a general

negative halo bias in parent ratings and confusion or bias arising specifically from ambiguous SA and OD behaviors.

This study maximizes control over the presented child behavior, but its analogue nature limits external validity. A second study was conducted to determine whether, in a clinical sample, the removal of ambiguous items from a commonly used rating scale would reduce the relatedness of SA and OD problems. Using parent and youth versions of the Achenbach System of Empirically Based Assessment (ASEBA; Achenbach & Rescorla, 2001), we constructed SA and OD scales using only unambiguous items. For the questionnaire rated by parents, we expected that the correlation between the unambiguous SA and OD item scales would be significantly smaller than the correlations between the syndrome and DSM-oriented scales, which contain both unambiguous and ambiguous items. In contrast, we expected that youth self-reports would be less influenced by ambiguous items and that there would not be a difference in the correlations between the unambiguous scales and the syndrome and DSM-oriented scales.

Study 1

Method

Participants. Seventy-two mothers (40 boys and 32 girls) were recruited for an internet-based study from various community sources (e.g., newspaper advertisements, school newsletters, lab newsletters) or were notified of the study through a volunteer registry of past research participants. Mothers were required to have spoken English for 3 years to be eligible to participate. Although 133 interested and eligible mothers responded to the advertisement, only 72 mothers (54.14%) completed all measures and were used in analyses.

Mothers' ages ranged from 27 to 54 years ($M = 38.32$, $SD = 5.55$), and the children's ages ranged from 7 to 10 years ($M = 8.35$, $SD = 1.02$). The families represented all

socioeconomic status (SES) classes (range, 1 to 5), as measured by the Hollingshead Four Factor Index of Social Status (Hollingshead, 1975) with a mean of 2.67 (SD = 0.82), which corresponds to middle class. In terms of marital status, 73.6% of mothers indicated they were currently married or were living with long-term partners, 16.7% were divorced, separated, or widowed, and 9.7% had never been married. Of the 95.2% of the mothers who reported their ethnicity, 73.9% identified themselves as Euro-Canadian, 13.0% as Asian, 2.9% as East Indian, and 10.0% as other, less frequent categories (e.g., 1.4% as First Nations and 1.4% as Hispanic).

Procedure. In the initial phone contact, mothers were told the study concerned influences on parent reports of child behavior and the co-occurrence of anxious and oppositional child behaviors. Each mother was given a personal login ID to access the study via the internet. The study website included a consent page, a general family information section, and eight scenarios describing children showing either anxious or oppositional behaviors, each followed by a rating form. Following the scenarios and ratings, mothers completed scales assessing anxiety and oppositionality in themselves and their own child. Mothers were mailed \$10 after completing the measures. Procedures were approved by our University's ethics board.

Scenarios and Ratings. Eight written scenarios were created. The scenarios were written at a grade seven level and were approximately 150 words in length and described children between 7 and 10 years displaying behaviors consistent with either SA or OD problems. This age range was chosen as one by which OD behaviors are likely to have emerged and SA behaviors are unlikely to be seen as developmentally appropriate (Klein, Kaplan Tancer, & Werry, 1996; Lahey, Loeber, Quay, Frick, & Grimm, 1996). The behaviors used in the scenarios were taken from three parent rating scales that assess OD and/or SA problems; the Oppositional Defiant Disorder Rating Scale (Hommersen et al., 2006), the Separation Anxiety Subscale of the Spence

Children's Anxiety Scale (Spence, 1998), and the Child Behavior Checklist (CBCL) Anxiety/Depression and Aggression scales (Achenbach & Rescorla, 2001).

Items from these measures were first separated into those that were considered to reflect Unambiguous Separation Anxiety (USA), Ambiguous Separation Anxiety (ASA), Unambiguous Oppositional Defiance (UOD), and Ambiguous Oppositional Defiance (AOD) behaviors. In order to separate items into these four categories, 10 clinical child psychologists, 3 professors of clinical child psychology, and 4 clinical psychology graduate students rated how representative the items from these measures were of either SA or OD problems in children. Each behavioral item was rated on an 8-point scale, with 1 being the anchor for the behavior being characteristic only of children with SA problems and 8 being the anchor for the behavior being characteristic only of children with OD problems.

Ratings for each item were averaged, and each item's overall average and modal response were used to separate the items into the four categories. Items with averages between 1 and 2.5 were considered to be USA items if their modal response was a 1 or 2, items with averages between 2.5 and 4.5 were considered ASA items if their modal response was 3 or 4, items with averages between 4.5 and 6.5 were considered AOD items if their modal response was 5 or 6, and items with averages between 6.5 and 8 were considered UOD items if their modal response was a 7 or 8. The item, "sudden changes in mood or feelings," although it had a mean of 4.6 and a modal response of 5, was negatively correlated with the other items forming the AOD category and was omitted. Of the remaining items, the 10 items in the USA category had a mean rating of 1.93 (SD = 0.66), the 8 items in the ASA category had a mean rating of 3.14 (SD = 0.67), the 12 items in the AOD category had a mean rating of 5.41 (SD = 0.64), and the 13 items in the UOD category had a mean rating of 6.91 (SD = 0.71). Internal consistencies for the ratings of items in

the four categories made by the 17 judges were satisfactory, .93 (USA), .79 (ASA), .85 (AOD), and .93 (UOD).

The items in each category are shown in Table 1. We note these groupings reflect only the expert consensus regarding the relative representativeness and ambiguity of each item with regards to characterizing children with SA or OD problems. We are not proposing that these items do or should represent diagnostic criteria for SA or OD disorders, nor are we suggesting that the existing measures are inappropriate tools for assessing SA or OD problems. Rather, these behavioral categories simply reflect that there is variation in the extent to which items are seen as specific to either SA or OD problems on rating scales commonly used to assess children with either type of problem.

To test for a general negative halo effect in maternal ratings of children, a Somatic Problems scale was constructed using seven items from the Somatic scale of the CBCL, which is the scale with the lowest correlations with the Anxiety/Depression and Aggression scales from which the anxiety and oppositional items were taken (Achenbach & Rescorla, 2001). Several CBCL Somatic scale items, such as “stomach aches,” were not used, as these symptoms may be part of SA problems. Instead, seven items that have no clear relation with either SA or OD problems, such as “eye problems that are not corrected with glasses” and “aches or pains (not stomach or headaches)” were used. These symptoms were never described in any of the scenarios, but were included in the list of behaviors mothers rated after each scenario.

The USA, ASA, UOD, and AOD items were used to compose scenarios describing children showing behaviors characteristic of either SA or OD, with identical scenarios created using male and female child names. Mothers responded to scenarios of children whose gender matched that of their own 7 to 10 year old child¹ in order to maximize the extent to which

mothers would identify with the situations in the scenarios. In the SA scenarios, the children displayed four of the USA behaviors and four of ASA behaviors; while similarly, in the OD scenarios described children displaying four UOD behaviors and four AOD behaviors. Within the SA scenarios, no OD behaviors were presented and, conversely, within the OD scenarios no SA behaviors were presented. Two random orders of the scenarios were created and randomly assigned within mothers of boys and girls.

After reading each scenario, but without being able to refer back to it, mothers were asked to rate the likelihood that the child in the scenario generally displays the items from the five categories of behaviors: USA, ASA, UOD, AOD, and Somatic. Mothers rated the presence of each behavior on a 6-point scale, with 0 (*the behavior is not or very rarely present*) to 5 (*the behavior is very frequently present*). The ratings were averaged across the items of each behavior category creating five scores for each scenario (USA, ASA, UOD, AOD, and Somatic), and these were averaged across the four scenarios of each type to create five scores for the SA scenarios and five scores for the OD scenarios. Within each scenario type, internal consistencies of the mothers' ratings across the items in each behavior category were high, with Cronbach's alphas ranging between .91 and .98.

Control Measures. The Brief Symptom Inventory (BSI; Derogatis, 1993) measures psychological distress with items rated from 0 (*not at all*) to 4 (*extremely*), and demonstrates satisfactory reliability and validity. The Anxiety and Hostility scales were used to assess whether the mothers' own experiences with anxiety and/or hostility (as a proxy for oppositional behavior) were correlated with their ratings of the scenarios. The internal consistencies in this sample of mothers were .84 for the Anxiety and .79 for the Hostility scale.

The Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) is a commonly used parent-rated measure of child problems with 113 items factored into syndrome scales. Parents are asked to describe their child's behavior over the past 6 months by rating the items 2 (*very true or often true*), 1 (*somewhat true*), or 0 (*not true*). The CBCL syndrome scales have good internal consistency and stability over time, and there is extensive content and criterion-related validity evidence (Achenbach & Rescorla, 2001). For this study, mothers completed the Anxiety/Depressed and Aggression scales for their own child to assess whether the mothers' experiences with these behaviors were related to their ratings of the scenarios.

Results

Control variables. Chi-square or t-tests indicated no significant differences between mothers assigned to the two random orders of scenarios in terms of ratings on the scenarios, child gender, SES, child age, maternal age, the BSI Anxiety and Hostility scales, or the CBCL Anxiety and Aggression scales (all $ps > .25$). Therefore, the data from the mothers assigned to the two orders were combined. There were no significant relations between maternal ratings of the scenarios and maternal age or SES ($ps > .05$). Mothers of younger children did have higher ratings on UOD items in the SA scenarios, $r(70) = -.28, p = .02$, and therefore child age was added as a covariate to the main analyses. Maternal BSI Hostility was not significantly correlated with ratings of the scenarios. However, there were significant correlations between the BSI Anxiety scores and ratings of the UOD items of the SA scenarios, $r(70) = .28, p = .02$, and the USA and Somatic items of the OD scenarios, $r(70) = .24, p = .04$ and $r(70) = .26, p = .03$. Mothers with greater anxiety reported higher levels of these three child behavior categories. As such, BSI Anxiety scores were added as a covariate to the analyses. Finally, CBCL Anxiety and

Aggression scores of the mother's own child were not significantly correlated with mothers' ratings of the scenarios.

Ratings of the Behavior Categories for the SA Scenarios. A repeated-measures ANOVA, with the behavior categories as the within-subjects variable and child age and maternal anxiety as covariates, was used to compare the average rating for each behavioral category (USA, ASA, UOD, AOD, and Somatic). The main effect of behavior category was significant, $F(2.41, 166.59) = 6.20, p = .001$, partial eta squared = .08 (small effect), and there was a significant interaction between behavior category and maternal anxiety, $F(2.41, 166.59) = 5.58, p = .003$, partial eta squared = .08. However, when a median split was used to separate mothers into high and low anxiety groups, ANOVAs within each group indicated that the main effect of behavior category was significant and in the same direction for each group. Therefore, ratings were collapsed across maternal anxiety level prior to the post-hoc comparisons.

Four pairwise comparisons were performed between ratings for 1) ASA and AOD items, 2) USA and ASA items, 3) AOD and UOD items, and 4) AOD and Somatic items, with alpha set at .01 (see Table 2). The first comparison was designed to test mothers' ratings of the anxiety versus the oppositional items. Because the means for the ASA and AOD categories were closest (with the unambiguous categories being even more distinct), the difference between means of the two ambiguous categories was tested. ASA items were rated as significantly more likely than the AOD items, $t(71) = 21.79, p < .001, d = 2.60$, indicating that mothers were clearly able to distinguish between items that were presented in the scenarios and those which were not. The next two comparisons tested differences in ratings of ambiguous and unambiguous items. The USA items were rated significantly more often than the ASA items, $t(71) = 4.53, p < .001, d = .53$. In addition, the AOD items were rated significantly more often than the UOD items, $t(71) =$

15.40, $p < .001$, $d = 1.81$. These results indicated that ambiguous items were problematic in general, as when compared to unambiguous items mothers were less likely to rate ambiguous behaviors that were actually presented in the scenarios, but were more likely to rate ambiguous behaviors that were not presented in the SA scenarios. The final post-hoc comparison was between the AOD items and the Somatic items, and tested for a general negative halo effect. Somatic items were endorsed with a moderate frequency and did not differ significantly from the AOD items, $t(71) = .47$, $p = .64$, $d = .06$. These results suggest that mothers perceived children with SA behaviors as being likely to show multiple types of problems, even when these problems were not expressed in the scenarios.

Ratings of the Behavior Categories for the OD Scenarios. As above, a repeated-measures ANOVA, with behavior category as the within-subjects variable and child age and maternal anxiety as covariates, was used to compare the average ratings for each behavioral category for the OD scenarios. There was a main effect of behavior category, $F(1.89, 130.70) = 6.33$, $p = .003$, partial eta squared = .08. Again, although there was a significant interaction between behavior category and maternal anxiety, $F(1.89, 130.70) = 8.28$, $p = .001$, partial eta squared = .11, analyses conducted separately for mothers in high and low anxiety groups found a significant and similar behavior effect for both groups. Therefore, ratings were collapsed across all mothers for the post-hoc analyses (see Table 2).

The first post-hoc test compared mothers' ratings of the OD items versus the SA items, using the AOD and ASA categories. As expected, the AOD items were rated by mothers as significantly more likely than the ASA items, $t(71) = 14.20$, $p < .001$, $d = 1.67$. Two comparisons were conducted for the ambiguous versus unambiguous items. UOD items had significantly higher ratings than AOD behaviors, $t(71) = 4.11$, $p < .001$, $d = .48$, and, ASA items

had significantly higher ratings than USA items, $t(71) = 12.52, p < .001, d = 1.48$. This again suggests that the ambiguous items are problematic in that they are less likely to be rated when present, and that mothers endorse the ambiguous behaviors that were not presented to a significantly greater extent than the not presented unambiguous items. The final comparison indicated that Somatic items were rated as significantly less likely in the OD scenarios than the ASA items, $t(71) = 20.38, p < .001, d = 1.20$. These results do not support a general negative halo effect, and suggest that for children with oppositional behaviors, mothers do not perceive the children as being more likely to show multiple types problems, but rather that there are particular behaviors, such as the ambiguous anxiety items, that mothers perceive as more likely to co-occur with oppositional symptoms.

Discussion

For both the SA and OD scenarios, mothers clearly rated the presented behaviors as occurring more often than the nonpresented behaviors. This is expected and reassuring, as clinicians routinely gather information from mothers as part of the child assessment process. However, within this context of overall accuracy, for both the SA and OD scenarios, mothers endorsed the scenario-consistent ambiguous items as significantly less likely than the scenario-consistent unambiguous items, despite the scenarios containing the same number of unambiguous and ambiguous items. Although this may indicate that mothers see these behaviors as less central to the presented problems, when this finding is coupled with the fact that mothers also were more likely to endorse ambiguous items of the nonpresented problems, despite the fact that these behaviors were never portrayed in the scenarios, the findings suggest that ambiguous items reduce the accuracy of mothers' ratings.

Most importantly, for both SA and OD scenarios, mothers rated the ambiguous items of the opposite problem as significantly more likely to be present than the unambiguous items of the opposite problem, despite neither ever having occurred in the scenarios. This suggests that, due to the ambiguous or context-lacking nature of some of the behavioral items used in parent-rated questionnaires, there is the potential for children with SA problems to be perceived as having some level of OD behavior due to the endorsement of ambiguous OD behaviors and similarly, that ambiguous SA behaviors may be endorsed for children with OD problems. Thus, at least to some extent, the degree of co-occurrence between SA and OD problems may be explained by ambiguous behavioral items.

In mothers' ratings of the SA scenarios, there was evidence that the endorsement of AOD items was part of a more general negative halo effect in that mothers also rated Somatic items as more likely to occur in these children than the UOD items. However, for the OD scenarios, this was not the case and it was only the ASA items, and not the Somatic items, that were rated more than the USA items. It also was the case that mothers rated the Somatic items as significantly more likely to occur among children in the SA scenarios compared to the OD scenarios, $t(71) = 4.35, p < .001, d = .51$. Mothers seem to perceive children with SA behaviors as likely to experience a range of other problems, consistent with a general negative halo effect, while only ambiguous items contribute to mothers' endorsement of anxiety behaviors in children with OD problems. Perhaps this is because mothers view children with anxiety problems as vulnerable and likely to react negatively to stressors (van der Bruggen, Stams, & Bogels, 2008) while they may view children who are oppositional as instigators (Dix & Lochman, 1990) with greater personal control and less likely to be affected by stressors.

Although the results of this analogue study indicate that mothers have the greatest degree of difficulty with regard to the endorsement of the ambiguously worded items in their ratings of hypothetical children, resulting in an increased overlap of SA and OD problems, it is difficult to know whether similar results would emerge in mothers' ratings of these symptoms in their own children. In addition, although the mothers in this sample were demographically similar to the community at large, and the relatively low response rate is consistent with previous web-based surveys (Kittleson & Brown, 2005), caution is needed in generalizing the findings. Similarly, because only two randomized orders of the scenarios were used, the possibility of order effects remains. Therefore, the second study was conducted using a clinical population and ratings of child behavior completed for the purpose of clinical assessment. This second study also allowed us to examine the influence of ambiguous items in accounting for the overlap in parent versus youth reports of SA and OD problems.

Study 2

This study used archival data from a youth assessment and treatment centre to examine the correlation between the ratings of SA and OD behaviors as completed by both parents and youth. We examined whether, using only the unambiguous SA and OD items of a commonly used behavior rating scale, the degree of overlap between the two problems would decrease. Again, we are not suggesting that these rating scales, as they are commonly used, are inappropriate assessment tools. Rather, our purpose is to examine the extent of overlap in SA and OD problems that may be accounted for by item ambiguity.

Method

Participants. Data from CBCL and Youth Self Report (YSR) forms (Achenbach & Rescorla, 2001) were reviewed from 219 case files (159 of the cases contained both CBCL and

YSR forms, 42 cases contained CBCL forms only, and 18 contained YSR forms only) of youth who were assessed in a 3-year period at a child and adolescent facility. Use of an adolescent sample extends the research question to this older age range. Data was collected for both males ($n = 146$) and females ($n = 73$) between the ages of 12 to 17 ($M = 14.37$ years, $SD = 1.50$ years). The SES of families was recorded in the clinical file for 90% of the cases using the Hollingshead's 9-step scale for parental occupation (Hollingshead, 1975). Based on the higher-status occupation in each household, 3.6% of families were described as upper class, 27.4% as upper middle class, 66.0% as lower middle class, and 3.0% as lower class. Of the 92.5% of parents who reported their relationship to the youth on the CBCL, most were the youth's biological mother (63.7%), although some were foster mothers (10.0%), biological fathers (9.5%), adoptive mothers (5.0%), or others (4.5%; e.g., child care workers, foster fathers).

Procedure. At the time of their admission to the facility, all children and parents were asked to sign consent forms that allowed assessment information to be used for research purposes. The assessments took place over the course of 3 to 4 weeks, during which time the parents and youth completed the CBCL and YSR, respectively. All procedures were approved by our University's ethics board and the research review committee at the youth facility.

Child Behavioral Measures. The CBCL (Achenbach & Rescorla, 2001) is described in Study 1. As reported in the manual, the internal consistency estimates for the scales used in Study 2 are high: .84 for the Anxious/Depressed scale (13 items) and .94 for the Aggression Problems scale (18 items), and moderate to high for the DSM-oriented scales: .72 for Anxiety Problems (6 items) and .86 for Oppositional Defiant Problems (5 items). The internal consistencies in our sample were similar to the normative sample: .80 for the Anxious/Depressed

scale, .90 for the Aggression scale, .73 for DSM Anxiety Problems and .81 for DSM Oppositional Defiant Problems.

The YSR (Achenbach & Rescorla, 2001) is the youth companion measure to the CBCL. It consists of 112 items factored into syndrome scales. Youth describe their behavior over the past 6 months by rating each item as 2 (*very true or often true*), 1 (*somewhat true*), or 0 (*not true*). The content and criterion-related validity of the YSR are strong (Achenbach & Rescorla, 2001), and it has good internal consistency and test-retest reliability. As reported in the manual, the internal consistencies of the syndrome scales used in this study are high: .84 for the Anxious/Depressed scale (12 items) and .90 for the Aggression scale (17 items); whereas the DSM-oriented scales show low to moderate internal consistency, .67 for Anxiety Problems (6 items) and .70 for Oppositional Defiant Problems (5 items). The internal consistencies for our sample were similar or slightly better: .84 for Anxious/Depressed, .86 for Aggression, .75 for DSM Anxiety Problems and .75 for DSM Oppositional Defiant Problems.

The syndrome scales of the CBCL and YSR were based on factor analyses, and the DSM-oriented scales were rationally created to closely resemble DSM-IV criteria (Achenbach & Rescorla, 2001). We acknowledge that the CBCL and YSR scales are not necessarily designed to specifically assess SA or OD problems. However, our purpose is to examine the degree of overlap between SA and OD problems when assessed using items specific to the disorders, versus using scales that include a broader array of items which, although they may apply to children with these problems, are ambiguous in their specificity to one problem versus the other. According to the expert judgments of items gathered in Study 1, both the syndrome and DSM-oriented scales of the CBCL and YSR contain both unambiguous and ambiguous items representing SA and OD problems. For our purposes, the items from the CBCL and YSR that

were judged as unambiguous in Study 1 were used to create USA (4 items) and UOD (8 items) scales. The internal consistency for the parent-rated UOD items was high (.80), and for the youth rated UOD items was moderate (.76). The internal consistencies for both the parent and youth rated USA items were lower, .64 and .63 respectively.

Results

Control Variables. Family SES was not significantly related to the ratings made by either the parents or youth (all p values $>.25$). However, youth age was significantly negatively related to the parents' ratings on both the Aggression scale, $r(200) = -.17, p = .01$, and the Oppositional Defiant Problems DSM scale, $r(200) = -.14, p = .05$. Youth age also was positively related to youth self-reported anxiety on the YSR, both for the Anxiety/Depression scale, $r(176) = .18, p = .02$, and the Anxiety Problems DSM scale, $r(176) = .23, p = .01$. Given these relations, age was controlled in all subsequent correlations.

Parent Ratings. Three correlations were calculated between parent-rated CBCL items, with youth age partialled from each (see Table 3). The Aggression and Anxiety/Depression syndrome scales, the Oppositional Defiant Problem and Anxiety Problem DSM scales, and the UOD and USA scales were all significantly correlated with each other. In order to test whether these correlations were significantly different, they were transformed to Fisher z -scores and compared using Steiger's (1980) Z statistic. The correlation between the parent-rated unambiguous scales and the correlation between the syndrome scales were significantly different, $z = 5.33, p < .001$. Similarly, the correlation between the parent-rated unambiguous scales was significantly smaller than the correlation between the DSM scales, $z = 2.86, p = .002$. Removal of ambiguous items reduced the overlap between parent-rated SA and OD problems.

Youth Ratings. Paralleling the analyses with parent CBCL scales, three correlations were calculated between the youth-rated items, with age partialled from each (Table 3). Although all three correlations were significant, they were small to medium in magnitude. The correlation between the youth-rated unambiguous scales was significantly smaller than the correlation between the syndrome scales, $z = 2.13, p = .02$. However, the correlation between the unambiguous scales was not significantly different from the correlations between the DSM scales of the YSR, $z = .32, p = .37$.

Parent and Youth Correlations. To examine the influence of item ambiguity on parent versus youth reports, we compared the correlations obtained for parents and for youth. The correlation between the youth-reported Anxiety/Depression and Aggression syndrome scales (.31) was marginally smaller than the correlation between the comparable parent-completed scales (.43), $z = 1.34, p = .09$, whereas the correlation between the youth rated unambiguous scales (.20) was not significantly different from the correlation between parent rated unambiguous scales (.17), $z = -0.30, p = .62$. The correlation between the parent DSM scales (.32) was not significantly different from the correlation between the youth rated DSM scales (.22), $z = 1.07, p = .14$. However, visual inspection shows that as the scales become increasingly focused on the unambiguous items (i.e., going from syndrome scales to DSM scales to unambiguous scales) the parent rated scales become less related to each other, while the youth rated scales do not change.

Examination of Scale Reliability. The unambiguous item scales, particularly the USA scales, were shorter and therefore of lower reliability than the CBCL syndrome scales, and it is possible that this may have reduced their correlations with each other. To test this, we constructed several 4-item scales using random samplings of items from the CBCL and YSR

Anxiety/Depression scales. These 4-items scales had internal consistencies ranging from .48 to .61, comparable to the internal consistency of our constructed unambiguous item scales. However, despite their lower reliability, the shorter CBCL and YSR Anxiety/Depression scales continued to show correlations with the CBCL and YSR Aggression scale ranging from .26 to .47, comparable to the correlations obtained with the full length scales. Thus, it appears that the limited number of items and reduced internal consistency of the brief unambiguous items scales does not completely account for their reduced inter-correlations relative to the syndrome scales.

Discussion

The use of a clinical sample in this study added ecological validity to the finding that ambiguous items increase the degree of overlap between parental ratings of SA and OD problems. Specifically, the degree of relatedness between parent ratings of only the unambiguous SA and OD items of the CBCL was significantly lower than the degree of overlap found for the syndrome and DSM scales. In addition, as hypothesized, using only unambiguous item scales had less impact on the degree of SA and OD overlap found in youth self-ratings, compared to parent ratings. We speculate that is because for youth, the “ambiguous” items are not truly ambiguous because their ratings reflect an insider’s understanding of the contextual nature of their behaviors. In sum, these findings highlight the importance of a multi-source approach and consideration of the strengths and weakness of both youth and parental reports in assessing the comorbidity between SA and OD problems.

General Conclusion and Discussion

In both a highly controlled analogue study and more naturalistic assessment in a clinical population, results indicated that the perceived co-occurrence between SA and OD problems can be partially attributed to the presence of ambiguous or context-lacking items used in parent

ratings of child behavior. Study 1 also indicated that, for SA problems, the increase in ratings of ambiguous behaviors may reflect a more general negative halo bias. However, the same was not true in ratings of OD behaviors where the over-reporting was more specific to SA behaviors that might be misperceived as characteristic of OD problems (e.g., crying). Study 2 demonstrated that when the focus of assessment was narrowed to only unambiguous exemplars of the two problems, the degree of perceived SA and OD comorbidity was significantly reduced. This decreased covariation is more in line with what is expected based on etiological theories of the disorders. Finally, we found that ambiguous items had a greater influence on the overlap of parent ratings of SA and OD problems, than on youth self-ratings. This suggests that youth may not endorse the ambiguous behaviors in the same way as parents, perhaps because they know the underlying motivations for their own behaviors, and this additional information counteracts the effects of item ambiguity in youth ratings (Grills & Ollendick, 2002).

We hasten to note that, although our findings provide evidence that halo biases and ambiguous items on rating scales can contribute to an increase in the relatedness of SA and OD problems, in Study 2 even using unambiguous item scales, SA and OD problems remained significantly related. Clearly, our findings do not support an argument that the comorbidity of these problems is entirely attributable to the methodological artifacts of ambiguous items and halo effects. Further research is needed to explore other reasons and mechanisms that may underlie the overlap of these problems. It may be, for example, that much of the research considering the etiologies of these problems has been conducted with children characterized by only a single disorder, and that the findings of these studies are not representative of community or clinical samples where comorbidities are more common (Jensen, 2003). Alternately, items and methods used to assess these problems may need to be more sensitive to the level of severity or

pervasiveness of behaviours. For example, common rating scales may be overly sensitive to transient or mild anxiety behaviors (e.g., worry about being caught in misbehavior) that might be experienced by youth with OD problems (Frick et al., 1999). Items also may need to be more careful in distinguishing the type of oppositional behaviour displayed by the child. For example, children with SA problems may display more reactive aggression, such as lashing out when they encounter anxiety-provoking situations, whereas children with OD problems may show both reactive and proactive oppositional or aggressive acts (Brendgen, Boivin, Dionne, Vitaro, & Pérouse, 2006). Likewise, future studies could also look at the methods used for gathering information from parents, and to see whether ambiguous symptoms are clarified by using interviews.

Implications

Our findings suggest that item ambiguity and the possibility of halo bias should be considered, not only in the construction of parent report measures of child behavior, but also within both research and clinical contexts where parental reports are used to assess child behavior problems. In developing parent rating scales, it would be useful to include additional context to clarify any potentially ambiguous behaviors (e.g., specifying circumstances in which the child might display the behavior). Additionally, in using current measures, clinicians and researchers must be attuned to the potential for ambiguous items to interfere with the accurate assessment of child problems. Probing for clarification of parental responses, perhaps in interview formats, and considering youth self-reports may be necessary to enhance our functional understanding of the child's behavior, and to ensure that the appropriate set of behavioral problems are targeted for treatment.

Limitations and Future Directions

We note that although we chose to examine the influence of item ambiguity and halo bias on the comorbidity of SA and OD problems, similar issues may arise with other child behavior problems. For example, the difficulty of distinguishing inattention-impulsivity from learning or conduct problems may also reflect issues of item ambiguity in parent rating scales (Drabick, Gadow, & Loney, 2007) and existing research suggests that adult' assessments of inattentive-hyperactive behaviors in children are influenced by co-occurring oppositional behaviors (e.g., Abikoff et al., 1993; Stevens et al., 1998). Although the use of 7 and 10 year old children in the first study and 12 to 17 year olds in the second study suggests that the problem of item ambiguity in parent ratings is not unique to a narrow age range, further study is needed to replicate and extend these findings. Similarly, future research could be useful in determining the extent to which teachers or fathers also are affected by ambiguous and context-lacking item descriptions in their reports of child SA or OD problems. Finally, as the samples in both studies were primarily European-Canadian, it would be useful to determine whether item ambiguity functions in the same manner across ethnic groups.

Conclusion

This research provided evidence for the effects of ambiguous/context-lacking items and negative halo bias in contributing to an increase in parent perceived comorbidity between SA and OD problems. Further study is required to determine whether these ambiguous items may be clarified for parents and help reduce the effects of this bias, or whether scales using only unambiguous items would have construct validity in the assessment of SA and OD problems. Overall, our findings provide a cautionary note and call for more careful attention to methodological factors that may influence the reported comorbidity of child behaviour problems.

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Footnotes

¹If mothers had more than one child in this age range, they randomly choose one as the target child for the study.

Table 1

Items in the Behavioral Categories

Unambiguous Separation Anxiety (USA)	Ambiguous Separation Anxiety (ASA)	Ambiguous Oppositional Defiance (AOD)	Unambiguous Oppositional Defiant (UOD)	Somatic
Clings to adults or too dependent	Nervous, high strung, or tense	Disobedient at school	Often blames others for his or her mistakes or misbehavior	Feels dizzy or lightheaded
Fears going to school	Worries	Talks about killing self	Destroys his/her own things	Constipated, doesn't move bowels
Too fearful or anxious	Feels worthless or inferior	Often loses temper	Destroys property belonging to others	Aches or pains (not stomach or headaches)
Feels afraid of being on his/her own at home	Feels he/she must be perfect	Suspicious	Often actively defies or refuses to comply with adults' requests or rules	Rashes or other skin problems
Worries about being away from parent	Cries a lot	Is often angry and resentful	Often deliberately annoys people	Problems with eye (not corrected by glasses)
Worries that something awful will happen to someone in our family	Fears he/she might think or do something bad	Screams a lot	Teases a lot	Sleeps more than most kids during day and/or night

Unambiguous Separation Anxiety (USA)	Ambiguous Separation Anxiety (ASA)	Ambiguous Oppositional Defiance (AOD)	Unambiguous Oppositional Defiant (UOD)	Somatic
Trouble going to school in the mornings because he/she feels nervous or afraid	Self-conscious or easily embarrassed		Is often spiteful and vindictive	
Fears certain animals, situations, or places other than school		Is often touchy or easily annoyed by others	Physically attacks people	
Scared if he/she had to stay away from home overnight		Sulks a lot	Disobedient at home	
		Temper tantrums or hot temper	Gets in many fights	
		Stubborn, sullen, or irritable	Threatens people	
			Unusually loud	

Table 2

Descriptive Statistics for Ratings of Behaviors in the Scenarios

Scenario	Scale	Mean	Standard Deviation	Minimum	Maximum
Separation					
Anxiety	USA	4.01	0.70	1.75	4.97
	ASA	3.86	0.63	1.97	4.97
	AOD	1.80	0.84	0.10	3.77
	UOD	.97	.72	0.00	3.06
	Somatic	1.74	1.11	0.04	3.96
Oppositional					
Defiant	UOD	3.83	.69	1.88	5.00
	AOD	3.71	.66	1.52	4.85
	ASA	2.20	.98	.19	4.28
	USA	1.52	1.07	0.00	4.08
	Somatic	1.40	1.07	0.00	3.50

Note. $N = 72$. Means were derived from ratings on a 6-point scale ranging from 0 to 5.

USA = Unambiguous separation anxiety items; ASA = Ambiguous separation anxiety items;
 UOD = Unambiguous oppositional defiance items; AOD = Ambiguous oppositional defiant
 items.

Table 3

Correlations for the Child Behavior Checklist, Youth Self-Report, and Unambiguous Item Scales

Parent Ratings	Correlated with	Correlation
CBCL Scale		
Anxiety/Depression	Aggression	.43**
DSM Anxiety Problems	DSM Oppositional Defiant Problems	.33**
USA Item Scale	UOD Item Scale	.17*
Youth Ratings	Correlated with	Correlation
YSR Scale		
Anxiety/Depression	Aggression	.31**
DSM Anxiety Problems	DSM Oppositional Defiant Problems	.22**
USA Item Scale	UOD Item Scale	.20**

Note. $N = 201$ for parent ratings and 177 for youth ratings. Youth age was partialled from all correlations.

USA = Unambiguous separation anxiety items; ASA = Ambiguous separation anxiety items;

UOD = Unambiguous oppositional defiance items; AOD = Ambiguous oppositional defiant items.

* $p < .05$. ** $p < .01$.