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Social Desirability and Self-Reported Anxiety in Children: An Analysis of the RCMAS Lie Scale

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There are important applied and theoretical reasons for research into the association between social desirability and self-reported anxiety in young people. The aim of this study was to examine the relationship between anxiety and social desirability in a large normative sample of 7- to 14-year-olds (N = 1,786). Participants completed the Revised Children's Manifest Anxiety Scale and their teachers rated children as anxious-not anxious according to specified descriptions. Results indicated that anxiety and lie scores do not correlate for either gender or age grouping. However, anxiety scores interacted with lie scores differently for males and females in terms of the agreement between children's and teacher's ratings of anxiety. Indications are that social desirability levels may in part explain the consistent discrepancies found between child and adult reports of anxiety in young people.

KEY WORDS: Social desirability; anxiety; RCMAS; lie scores.

The Revised Children's Manifest Anxiety Scale (RCMAS: Reynolds & Richmond, 1979) is one of the most widely used self report inventories of anxiety in children and adolescents. It has been extensively researched indicating good reliability and validity across a number of diverse cultural and ethnic groups (e.g., Boehnke, Silbereisen, Reynolds, & Richmond, 1986; Ferrando, 1994; Mattison, Bagnato, & Brubaker, 1988; Reynolds & Paget, 1981, 1983; Richmond, Rodrigo, & Rodrigo, 1988; Wilson, Chibaiwa, Majoni, Masukume, & Nkoma, 1990). However, recent studies have found that existing and well known self-report measures of anxiety, including the RCMAS, have questionable validity in terms of discriminating between anxious and other (nonanxious) clinic-referred children, particularly children with attention deficit disorder (Mattison et al., 1988; Perrin & Last, 1992). Dadds, Spence, Holland, Barrett, and Laurens (1997) found that nonclinic children's scores on the RCMAS showed surprisingly low convergence with their teacher's ratings of anxiety in the children. Similarly, a wealth of research has found low agreement between children's and parents' ratings (Silverman, 1994).

It is clear that the accurate measurement of anxiety in children is a complex enterprise and studies of the development and management of anxiety in young people may be suffering due to a lack of measurement accuracy, especially when self-reports are used. Given this, it is surprising to note that the RCMAS is rarely used to its fullest potential. That is, the scale was designed not only to measure symptoms of self-reported anxiety, but the tendency of the reporting person to fake good in a socially desirable direction (the Lie scale). However, whether the use of the Lie scale can be used to increase the accuracy of assessments of anxiety in children has not been adequately addressed in the research literature.

A number of normative population studies aiming to assess the psychometric properties of the RCMAS have found age, gender, and cultural differences on the Lie scale (e.g., Boehnke et al., 1986; Reynolds & Paget, 1981, 1983, 1984; Wilson et al., 1990). However, studies that have used the Lie scale of the RCMAS in a clinically or theoretically meaningful way are rare, and the majority of clinical studies omit reporting on the Lie measure entirely. In Mattison et al.'s (1988) examination of the relation-

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ship of RCMAS factor scores to *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.) (DSM-III; American Psychiatric Association, 1980) diagnoses, only the general Worry/Oversensitivity subscale had validity; the Lie score was not predictive. However, Dadds et al. (1997) found evidence that Lie scores may be predictive of response to psychosocial treatment for anxiety. Specifically, a subset of the anxious children who participated in their intervention trial had been nominated by teachers as having anxiety problems, but denied anxiety problems themselves. For these children, high Lie scores were associated with poor treatment outcome.

At the most obvious level, high Lie scores could be held to indicate the low validity of the children's reports of their anxiety. However, this has not to our knowledge ever been formally tested and in reality the relationship between anxiety and social desirability appears to be more complex. Wanting to appear perfect may be a characteristic trait of anxious children and, thus, a positive correlation between Lie scores and anxiety levels could be expected. Similarly, many anxious children are quite well behaved and so it is likely that high Lie scores may reflect a real tendency in anxious children to behave perfectly. Clearly, the measurement of anxiety in young people can be aided by the examination of these issues in more detail.

There are also important theoretical reasons for examining the relationship between anxiety and social desirability. In the adult literature, high social desirability combined with low self-reported anxiety has become the empirical marker for "repressive" emotional processing style, defined as a pervasive tendency to avoid processing negative emotions (Weinberger, 1990). Adults with this style take longer and are less productive in retrieving emotional memories (Davis, 1987), are at higher risk for serious health problems, and exhibit high levels of physiological arousal during stressful tasks (see Singer, 1990, for review). Recently, this validity of the "repressor" construct has been confirmed with adolescents (Fritz, Spirito, & Yeung, 1994). However, the relationship between open and avoidant emotion processing has not been explored with regard to the development of anxiety problems in young people.

Thus, the aim of this study was to conduct a preliminary examination of the Lie scale in a large sample of 7- to 14-year-old people. Specifically, the following questions were asked:

What is the relationship between self-reported anxiety and social desirability in children and adolescents? In the original study, Reynolds and Richmond (1979) found a low but significant positive correlation between the two. However, few other studies have reported on this relationship, and at least one found a negative correlation (Wilson et al., 1990). Joiner, Schmidt, Schmidt, and Norman (1996) found that high Lie scores were associated with relatively low levels of self-reported depression, but had no relationship to reports of anxiety. Hagborg (1991) found that Lie scores were associated with low levels of self-reported anxiety in males only. Similarly, the repressor literature has consistently found males to have higher repressive styles (e.g., Davis, 1991) and this gender difference in repressor style is predictive of differences in the type of emotional/behavioral problems found in children (Fritz et al., 1994) . Thus, previous research has not produced consistent findings and further research is needed to clarify the relationship between self-reported anxiety and social desirability particularly with regard to gender of the child. Do children who appear anxious to adults but deny their own anxiety have higher Lie scores? If so, does this vary by age and gender? If social desirability does influence the child's reports of anxiety, this may in part explain the consistent discrepancy found between child and adult reports of anxiety in young people.

METHOD

Participants

Participants were 1,786 children (1,056 = 59.1% females, 730 = 40.9% males), representing all children aged between 7 and 14 years of age from Grades 3 to 7 of eight preselected primary schools in the metropolitan area of Brisbane, Australia, an urban city of approximately 1 million people. The schools were selected to represent each of three levels of socioeconomic status on the criteria of average income and occupational status of the population of the school catchment area. The percentage of families in each of the eight catchment areas earning less than $16,000 per year ranged from 4 to 24%, and above $60,000 from 7 to 30%. The majority of children attending these schools (and living in Brisbane in general) were white, Anglo-Celtic, Catholic or Protestant Christian, and working class to middle class. Substantial ethnic populations of Chinese, Vietnamese, Latin American, Greek, and Italian also existed in varying numbers (5 to 27% from non-English speaking backgrounds) across catchment areas.

Measures

Child Reports. All the children (N = 1,786) completed the Revised Children's Manifest Anxiety Scale (Reynolds & Richmond, 1979). The checklist contains 37 items, 28 measuring anxiety and producing a total Anxiety score, and nine measuring social desirability and producing a Lie score. The anxiety items have consistently been found to load on three correlated factors: Worry/Oversensitivity, Physiological Symptoms, and Inattentiveness. Some studies have found the Lie scale items can be represented as two separate factors, but generally the second is unstable and not consistently supported. In this study, the total Anxiety and Lie scores were used. The latter has been shown to converge with established measures of social desirability (Hagborg, 1991), and hence the terms Lie scale and social desirability are used interchangeably.

Teacher Reports. Teachers were asked to nominate up to three children from each of their classes who displayed the most anxiety (i.e., were shy, nervous, afraid, inhibited; this was an *inclusion* criterion) and up to three who displayed the most disruptive behavior (i.e., were impulsive, aggressive, hyperactive, noncompliant; this was an *exclusion* criterion). Previous research has supported the ability of teachers to identify children at risk for anxiety (Dadds et al., 1997; Strauss, Frame, & Forehand, 1987) and disruptive behavior problems (Kazdin, 1987) using such nomination procedures with this age group. To help them do this accurately, descriptions of a (gender not specified) child displaying worry, social shyness, lack of confidence, and fears, and a child displaying impulsive, oppositional, and aggressive behavior, were provided.

Parent Interviews and Reports. Parents of children who either scored above 19 on the RCMAS Anxiety scale, and/or were nominated by teachers as being anxious, and were not identified by teachers as being disruptive, were telephoned and briefly interviewed with the aim of arranging face-to-face diagnostic interviews (at school or home). The telephone calls and interviews were conducted by clinicians (postgraduate clinical psychology students and clinical psychologists) who had received 10 hours training in the specific protocol skills for approaching and interviewing families. At the face-to-face interview, the parents of each child provided demographic data, completed the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1991) which was used as a treatment outcome measure and not for screening, and were administered the Anxiety Disorders Interview Schedule for Children—Parent Version (ADIS-P; Silverman & Nelles, 1988) to produce a DSM-IV (APA, 1994) diagnostic formulation for each child. The ADIS-P assessed internalizing disorders (separation anxiety disorder [SAD], social phobia, specific phobias, generalized anxiety disorder [GAD], panic disorder with or without agoraphobia, obsessive and compulsive behavior, post-traumatic stress disorder, sleep terror, dysthymia, and major depression), externalizing disorders (attention deficit/hyperactivity disorder, oppositional defiant disorder and conduct problems), and functional enuresis, substance abuse, and schizophrenia.

Clinicians rated the severity of children's disordered behavior and the extent of interference caused by those behavior on an 8-point rating scale: 0 = *absent* (*no interference*), 2 = *mild* (*slightly disturbing/not really disabling*), 4 = *moderate* (*definitely disturbing/disabling*), 6 = *marked* (*markedly disturbing/disabling*), 8 = *severe* (*very severely disturbing/disabling*). A rating on the scale was given for each diagnostic category for which parents reported their child showing problems. Children who met criteria for a DSM-IV anxiety disorder received a severity rating of 3 or more. Children who met one or more, but not all of the criteria for a DSM-IV anxiety disorder were classified as having "features" of the disorder and received a rating of 1 or 2 on the scale. Several children whom parents reported as shy/sensitive yet did not show behavior specific to an anxiety diagnosis were considered to have a "nonspecific sensitivity" and received a rating of 1 on the scale.

RESULTS

Internal consistency of both the total Anxiety scores (alpha = .87) and the Lie scores were high (alpha = .80), confirming our decision to use these single scales only. First we examined correlations between Anxiety and Lie scores for the sample broken down by a median split of age (younger: 7 to 10; older: 11 to 14) and gender. No relationship was found between the Anxiety and Lie scores for any group (younger males: r = .02; younger females: r = −.08; older males: r = −.08; older females: r = −.04). This failure of the Anxiety and Lie scores to correlate remained even when the correlations were calculated for individual items on each scale.

Table I shows means and standard deviations on the Anxiety and Lie scores for the sample again bro-

Table I. Means and Standard Deviations for the Anxiety Total Score and Lie Score Broken Down by Age and Gender

		Males		Females	
		7-10 years (n = 513)	14 years (n = 217)	7-10 years (n = 667)	11-14 years (n = 389)
Anxiety	*M*	11.45	10.14	13.20	11.68
	SD	5.88	6.02	6.32	6.31
Lie	*M*	3.07	2.29	3.45	2.11
	SD	2.60	2.34	2.66	2.17

ken down by age and gender. For the Anxiety scores, analyses of variance (ANOVAs) showed main effects for gender, $F(1, 1{,}664) = 24.98, p < .001$, and age, $F(1, 1{,}664) = 18.53, p < .001$, but no interaction between the two. Being female and younger were independently associated with higher reports of anxiety. For the Lie scores, there was a main effect for age, $F(1, 1{,}664) = 62.59, p < .001$, in that Lie scores decreased with age, and an interaction between age and gender, $F(1, 1{,}664) = 4.43, p < .05$. Follow-up *t*-tests indicated that females had higher Lie scores than males in the younger group, $t(1023) = -2.36$, $p < .05$, but no gender differences were significant in the older group.

Next we wanted to examine the relationship between self-reported anxiety, social desirability, and teachers' ratings of the children. The teachers' ratings were a dichotomous variable (anxious vs. not anxious), so for ease of analysis children's Anxiety scores were converted to a dichotomous independent variable by calculating a median split of 0 to 19 (low anxiety) and then 20 and above (high anxiety). Previous analyses have supported the discriminant validity of this cutoff (Dadds et al., 1997). Our aim was to conduct ANOVAs evaluating age, gender, teacher rating, and child rating as independent variables on the dependent variable of Lie score. Using the four variables resulted in some cell sizes less than 20 and unstable variance, so age was used as a covariate and eliminated as an independent variable. The resulting analysis produced means shown in Fig. 1. The analysis of covariance (ANCOVA) produced a significant main effect for teacher rating, $F(1, 1{,}785) = 8.41, p < .01$, child rating, $F(1, 1{,}785) = 6.89, p < .01$, and a significant interactions between teachers' ratings, children's ratings, and gender, $F(1, 1{,}778) = 4.16, p < .05$. The main effect showed that children who were rated by teachers as being anxious had higher Lie scores (M = 3.43) than children not so rated (M = 2.83). Interpretation of the main effect for child rating was avoided due to its small effect size, the presence of the higher-order interaction, and the previous correlational analyses showing that Anxiety scores treated as a continuous variable were not associated with Lie scores. The nature of the three-way interaction can be seen in Fig. 1. For boys only, higher Lie scores were associated with the teacher and child disagreeing on anxiety in the child. That is, they agreed where the child had relatively low Lie scores, and disagreed where the child had higher Lie scores. This needs to be interpreted in terms of the relative numbers in each of the cells. Specifically, the teacher-yes, child-yes agreement cell contained comparatively low numbers of boys (1.1%) compared to girls (2.6%). Thus, it appears that teachers were rarely likely to agree with boys on their anxiety, and this tended to occur most when those boys had low Lie scores.

To examine whether using the Lie scores in conjunction with Anxiety scores led to higher agreement between children and teachers, forward conditional logistic regression on SPSS-X was used to predict teachers' dichotomous ratings of the children (anxious vs. not anxious) from the children's Anxiety and Lie scores. A regression was run for each gender

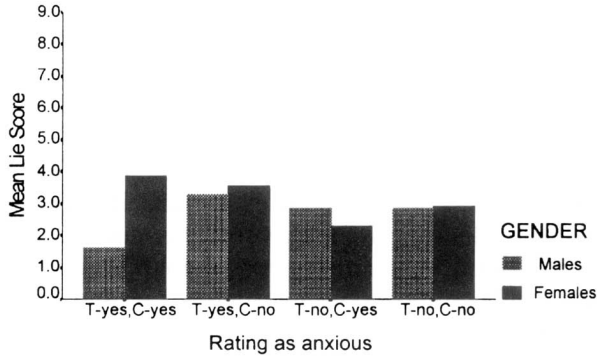

Fig. 1. Lie scores broken down by gender and rating of child as anxious or not by teacher (T-yes vs. T-no) and child (C-yes vs. C-no).

Table II. Correlations and *T*-Scores from the Regression Predicting Severity of Anxiety Problems as Rated by Clinicians after Parental Interviews, and Age, Child Self-Reports (RCMAS Anxiety and RCMAS Lie) and Teacher Ratings of Anxiety in the Children[a]

		Age	Teacher rating	RCMAS Anxiety	RCMAS Lie
Females	*r*	-0.03	0.44[b]	0.32[b]	-0.03
	t	0.01	15.71[b]	10.27[b]	-1.97[b]
Males	*r*	-0.06	0.50[b]	0.12	-0.02
	t	2.10	15.63[b]	2.69[b]	-1.51

[a]RCMAS = Revised Children's Manifest Anxiety Scale.
[b]$p < .05$.

crossed with age groups. For younger boys, no variables entered, indicating no agreement between child and teacher ratings. For older boys, the anxiety score significantly predicted the teachers' ratings, Wald(1) = 5.11, $p < .05$, $\chi^2(1) = 5.22$, $p < .05$, but the Lie score added no prediction. For younger girls, both anxiety, Wald(1) = 5.44, $p < .05$, and Lie, Wald(1) = 4.19, $p < .05$, scores added significant prediction to teachers' ratings, $\chi^2(1) = 4.17$, $p < .05$. For older girls, both were again significant [Anxiety: Wald(1) = 8.11, $p < .01$, Lie: Wald(1) = 8.08, $p < .01$], $\chi^2(1) = 7.71$, $p < .01$. The higher the female's Lie score, the more likely she was to be rated by her teacher as being anxious.

Finally, we wanted to assess whether the use of the Lie scale added prediction over and above Anxiety scores to the severity of anxiety problems of the child as rated by the independent clinician after jointly interviewing the child and her/his parents. Of the $n = 314$ who either scored above 19 on the RCMAS Anxiety scale or were nominated by teachers as being anxious, $n = 181$ agreed to attend the diagnostic interview. Of these, 55% were found to meet criteria for a DSM-III or DSM-IV anxiety disorder and 20% had features of an anxiety problem (kappa for interdiagnostician agreement = .88, correlation between diagnostic severity ratings $r = .89$; see Dadds et al., 1997, for details). Children who scored 19 and below on the RCMAS and were not nominated by teachers, and thus were not interviewed, were assigned a diagnostic severity rating of zero. Severity ratings for children who attended interviews ranged from 0 to 8. Thus, the regression used severity rating as the dependent measure and age, followed by teacher's rating and child's RCMAS Anxiety score, followed by the Lie score, as predictors entered in stepwise fashion.

Table II shows bivariate correlations and *t*-scores for the predictors of age, RCMAS Anxiety, teacher ratings, and RCMAS Lie, against the dependent variable of severity of anxiety problems as rated by clinicians. For both males and females, age did not enter as a significant predictor. For males, both teachers' ratings and their Anxiety scores significantly predicted the independent clinicians' ratings, accounting for 26% of the variance, $F(3, 726) = 127.9$, $p < .0001$. Lie scores had no relationship with clinicians' ratings either as a bivariate correlation or in the regression equation. For females, both teachers' ratings and child Anxiety scores significantly predicted clinicians' ratings, accounting for 26% of the variance, $F(3, 1{,}052) = 195.0$, $p < .0001$. Despite Lie scores having no direct bivariate relationship with clinicians' ratings ($r = -.03$), the addition of the Lie scores was associated with an extra 2.5% of explained variance in the regression equation, $F(1, 1{,}051) = 3.89$, $p < .05$.

DISCUSSION

The main findings of this study can be summarized as follows. First, we supported previous findings (e.g., Reynolds & Richmond, 1979) that Lie scores decrease with age, presumably reflecting normal developmental changes in ability to report accurately on one's behavior compared to ideals of behavior. Second, we found no evidence that self-reported Anxiety scores correlate with social desirability for any age or gender in this sample. This is consistent with previous studies. While the original study found a low positive correlation (Reynolds & Richmond, 1979; $r = .15$), others have found a negative correlation (Wilson et al., 1990). Joiner et al. (1996) found that high Lie scores had no relationship to reports of anxiety, while Hagborg (1991) found that Lie scores were associated with low levels of self-reported anxiety in males only. Given the present findings and that previous research

has been so inconsistent, the likelihood that a consistent relationship between RCMAS Anxiety and Lie scores exists is dubious. Because these variables are not correlated does not imply, however, that they cannot or do not work together to influence other important outcomes. The repressor literature shows that coexisting high social desirability and low self-reported anxiety is predictive of important styles of emotion processing.

Thus, the important analyses concern the interaction between anxiety and social desirability. In this regard, our third finding was that mean Lie scores varied according to the teacher's and child's independent ratings of anxiety in the child. The main effect found for teachers' ratings was modified by an interaction between the children's ratings and gender. For females, only a main effect for teacher rating was found. Thus, girls rated by teachers as anxious had higher Lie scores than those not so rated. For males nominated by teachers as being anxious, Lie scores were significantly lower for those who also rated themselves as anxious compared with those who disagreed with the teacher and rated themselves as not anxious. These results indicate there are important gender differences in the extent to which children acknowledge their anxiety and the salience of that anxiety to adult caregivers.

Related to this interaction, our final finding was that the use of Lie scores increased the agreement between children and teachers for females only. For boys, agreement between teachers and children was relatively low and only for the older group did the children's scores on the Anxiety scale significantly correlate with the teachers' ratings. The Lie score had no relationship. For females, the convergence between teachers' and the children's ratings was higher than for males but still low overall. Self-reported anxiety correlated positively with teachers' ratings and Lie scores added significantly to prediction of teachers' ratings after the children's anxiety ratings had been entered. The higher their Anxiety scores and the higher their Lie scores, the more likely females were to be identified by teachers as anxious.

Similar results were found when the diagnostic severity rating of the child as made by an independent clinician after interviewing the parent and child was used as the dependent variable. Both teacher's and child's ratings were significantly correlated with the clinicians' rating. The addition of the lie scale score added further explained variance for the females only.

A potentially important limitation of studies operationalizing social desirability as scores on a Lie scale is that the results tell us little about how participants themselves view their own social desirability, and the social desirability or undesirability of the variable of interest, in this case, anxiety. That is, the Lie scale measures the extent to which children report their behavior is perfect, and then the construct of social desirability is inferred from these reports. With anxious children, it is possible that many of these perfectionistic reports may actually be characteristic of their behavior. Future research might benefit by using measures which have more face validity by asking participants directly about the extent to which they try to appear perfect, hide problems from other people, and deny their feelings. With regard to anxiety it would be useful to ask children directly about the acceptability and social costs of showing fear and worry to adults and peers.

One of the main aims of this study was to examine whether social desirability may in part explain the discrepancy between child and adult ratings of anxiety in children. To do this we compared the child ratings, with or without the Lie scale included, with the adult ratings. This should not be seen as implying that the teachers', parents', and clinicians' ratings of anxiety in the children are more accurate measures than the children's reports. The low convergence between adult caregivers and children typically found in this area is no doubt attributable to some inaccuracy on the part of all informants. Our aim has been to try to understand that low convergence rather than use adult ratings as "gold standard" to which the child ratings should be compared.

Overall, these findings show that, while self-reported anxiety and social desirability scores do not show a simple correlational relationship, they can interact with gender to show different patterns of association with adult's ratings of the child's anxiety, and the agreement between the child and the adult. The present study used a large normative sample of children and so power and representativeness in 7- to 14-year-old Caucasian children were high. Given the low agreement levels typically found between adults and children with regard to assessing anxiety in children and the emerging findings that anxiety may interact with social desirability to predict emotional processing style, further research should seek to further clarify the relationship between these constructs.

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