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A new look at inter-informant agreement on conduct disorder using a latent class approach

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Abstract

This study examined agreement on aggressive and nonaggressive conduct disorder in a general population sample of 14- to 17-year-old adolescents (n=1165) and their mothers. We collected diagnostic interview data and applied latent class analyses to estimate inter-informant agreement. The preferred model for aggressive conduct disorder for both males and females was a one-latent-variable/two-class model specifying no inter-informant disagreement beyond chance expectations. This model estimated the prevalence of aggressive conduct disorder to be 13% for males and 0.4% for females. For nonaggressive conduct disorder, a one-latent-variable/three-class model specifying asymmetric agreement was preferred for both males and females. This model estimated the prevalence of nonaggressive conduct disorder in adolescents to be 18% according to males and 13% according to mothers. Prevalence estimates were 12% according to females and 7% according to mothers. Symptom sensitivity estimates for all models were poor whereas specificity estimates were near perfect to perfect. Males had higher rates of aggressive and nonaggressive conduct disorder across informants. There was a high level of adolescent–mother agreement on both types of conduct disorder. However, there were some differences, suggesting that aggressive and nonaggressive are two valid subtypes of conduct disorder with different prevalence estimates and agreement levels.
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1. Introduction

Epidemiological studies of adolescent psychiatric disorders often collect data from more than one

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informant, and most report little to no inter-informant diagnostic agreement (Offord et al., 1989; McGee et al., 1990; Bergeron et al., 1992; Andrews et al., 1993). Low inter-informant agreement may be due to variations in situation and interaction partner (Achenbach et al., 1987). Parents may be unaware of their child's covert feelings (e.g., depression), or they may have limited access to the range of situations in which their child is exhibiting problematic behavior. In contrast, children may not consider their behaviors to be problematic, or they may exhibit these behaviors to varying degrees depending on the situation (Cantwell et al., 1997).

While these explanations may account for low inter-informant agreement, at least one other often overlooked possibility is that of problems with the case definition strategy (i.e., the process by which individuals are judged to have or not have a disorder). One common case definition strategy, such as that used in the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994), involves counting symptoms and establishing psychiatric diagnoses based on whether the number of symptoms exceeds a specified cut-off or threshold value. However, there is no "gold standard" for perfectly distinguishing between individuals with and without a psychiatric diagnosis. As a result, classification errors involving false positives and false negatives undoubtedly will occur (Zarin and Earls, 1993).

1.1. Effects of misclassification on inter-informant agreement

Using data with classification errors to estimate the association between two informants (e.g., by way of odds ratios or kappa coefficients) will always result in estimates that are biased toward the null hypothesis that there is no inter-informant agreement (Barron, 1977; Kraemer, 1979, 1985). Let us consider a situation where two informants independently assign children to one of two diagnostic categories (i.e., presence or absence) on the basis of several symptoms. Let us further suppose that the two informants made no errors in assigning children to the diagnostic categories. Such a situation could hypothetically assume the following values:

		Informant A	
		Presence	Absence
Informant B	Presence	0.05	0.04
	Absence	0.06	0.85

The error-free association between Informants A and B can be calculated, using the odds ratio statistic, as (0.05)(0.85)/(0.06)(0.04)=17.71.

Let us now consider the more realistic situation where both informants independently commit errors in their classification of children into the diagnostic categories. In other words, symptom sensitivity (i.e., conditional probability that a particular symptom is present among individuals with a disorder) and symptom specificity (i.e., conditional probability that a particular symptom is absent among individuals without a disorder) are not perfect. Suppose that the probability of Informant A correctly identifying the presence of the disorder is a_1=0.70 (i.e., sensitivity) and the probability of correctly identifying the absence of the disorder is $1-a_2$=0.85 (i.e., specificity). The probability of Informant B correctly identifying the presence of the disorder is b_1=0.65 (i.e., sensitivity) and the probability of correctly identifying the absence of the disorder is $1-b_2$=0.80 (i.e., specificity). In this case, the observable joint probabilities of classification, based on formulas presented by Fleiss (1981), are as follows (see Appendix A for calculations):

		Informant A	
		Presence	Absence
Informant B	Presence	0.06	0.18
	Absence	0.15	0.61

The odds ratio measuring the observable association between Informants A and B is (0.06)(0.61)/(0.15)(0.18)=1.36, which is substantially lower than the odds ratio calculated for data without classification errors. The take-home message from our example is that, unless we know the amount of misclassification in our data, it is not possible to know the extent to which the observed lack of

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