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Development of the Adolescent Measure of Empathy and Sympathy (AMES)

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ABSTRACT

The aim of the present study was to develop and validate a new instrument to measure empathy and sympathy in adolescents that differentiates between empathy and sympathy, and balances its emphasis on affective and cognitive empathy. The psychometric properties of the Adolescent Measure of Empathy and Sympathy (AMES) were established in two studies. In the first study, among 499 adolescents (10–15 years old), the structure of the AMES was investigated and the number of items was reduced. In the second study, among 450 adolescents, test-retest reliability and construct validity of the AMES was evaluated. Results indicate that the AMES met the standards of reliability and validity. By specifically distinguishing between affective empathy and sympathy, the AMES provides a distinct advantage over existing measurement tools and is useful in elucidating the relationship between empathy and behavior in adolescents.

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1. Introduction

Empathy plays an important role in the development of social behavior in adolescents. In its early days, researchers studying empathy mainly emphasized its affective nature and defined it as a vicarious emotional response to the perceived emotion of others (e.g., Mehabrian & Epstein, 1972; Stotland, 1969). Later, researchers acknowledged that this one-dimensional view of empathy erroneously omits the role of cognition. To that end, researchers now posit that empathy is a multidimensional concept consisting of both an affective and cognitive component (e.g., Feshbach, 1975, 1997; Hoffman, 2001). Whereas the affective component pertains to the experience of another person's emotional state, the cognitive component refers to the comprehension of another person's emotions. Although empirical literature has not consistently distinguished between these two subtypes of empathy, neurological research has indeed shown that these components reflect independent processes and are governed by separate brain systems (Nummenmaa, Hirvonen, Parkkola, & Hietanen, 2008; Shamay-Tsoory, Aharon-Peretz, & Perry, 2009).

Trait empathy has most commonly been studied in relation to prosocial and moral behavior of children and adolescents. The research to date has shown that adolescents with higher levels of trait empathy exhibit more prosocial and altruistic behavior (McMahon, Wernsman, & Parnes, 2006; Roberts & Strayer, 1996) whereas adolescents with lower levels of empathy have been shown to be more aggressive (Jolliffe & Farrington, 2004, 2006b; Richardson, Hammock, Smith, Gardner, & Signo, 1994). Given the important role of empathy in social behavior, it is critical that researchers have a valid way of assessing this construct. At present, there are several scales available for researchers to use. These include the 'Index of Empathy for Children and Adolescents' (IECA, Bryant, 1982), the empathy subscale from the Children's Behavior Questionnaire (CBQ, Rothbart, Ahadi, & Hershey, 1994), the Interpersonal Reactivity Index (IRI, Davis, 1980) and the Basic Empathy Scale (Jolliffe & Farrington, 2006a). Although widely used, there are several critical limitations to these scales.

First, some of these scales do not distinguish between an affective and a cognitive component of empathy. Rather, they measure empathy as a single construct (e.g., IECA and the CBQ). Second, in many of the existing scales, item wording is often ambiguous. Items such as "I often get swept up in my friend's feelings" from the BES or "I am often quite touched by things I see happen" from the IRI are likely to result in differences in interpretation (i.e., what does it mean to be swept up or quite touched?). Given that ambiguous and vague items result in decreased measurement validity (De Leeuw, Borgers, & Smits, 2004), efforts to ensure that items are clear and unambiguous are justified.

Lastly, several empathy scales equate affective empathy with sympathy (e.g. IRI and IECA). Affective empathy and sympathy

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are both emotional reactions to the perceived emotions of another person. However, in the case of empathy, the emotion is the same as the emotion of the other person (emotion congruence). With sympathy, however, individuals experience feelings of concern and sorrow about distressful events in another person's life (Clark, 2010). Some researchers believe that sympathy actually results from affective empathy (Eisenberg & Fabes, 1990), but few assessments actually distinguish between them. In the IECA (Bryant, 1982), there are several items that measure sympathy instead of empathy (e.g., "It makes me sad to see a girl who cannot find anyone to play with"). Similarly, the empathic concern subscale of the IRI consists of items which are much more closely aligned to sympathy than to empathy (e.g., "When I see someone being taken advantage of, I feel kind of protective towards them") and is often used as a measure of sympathy (Eisenberg, Cumberland, Guthrie, Murphy, & Shepard, 2005; Laible, 2004).

1.1. The Adolescent Measure of Empathy and Sympathy (AMES)

The limitations of the existing empathy measures demonstrate a clear need for an improved measure for adolescents. The aim of this study is to develop a validated measure of empathy *and* sympathy that addresses the aforementioned limitations of existing scales. Specifically, the Adolescent Measure of Empathy and Sympathy (AMES), (1) balances the emphasis on affective empathy and cognitive empathy, (2) uses unambiguous wording and (3) distinguishes between empathy and sympathy. In this scale, affective empathy is defined as "the experience of another person's emotion" (Mehabrian & Epstein, 1972), cognitive empathy is defined as the "comprehension/understanding of another person's emotion" (Hogan, 1969), and sympathy is defined as "feeling concern or sorrow for another person's distress" (Clark, 2010).

In order to establish reliability and validity for the AMES, two studies were conducted. In the first study, we investigated whether the items of the AMES clustered into the three expected subscales (i.e., affective empathy, cognitive empathy, sympathy) in an adolescent sample (10–15 years). Furthermore, in the first study, the number of items was reduced in order to minimize the response burden, which is preferable when working with young respondents. In the second study, we used a new and independent sample of adolescents to confirm the structure of the AMES identified in Study 1 as well as to investigate its test-retest reliability and construct validity.

1.2. Validation of the AMES

To assess the construct validity of the newly developed AMES, the relationships between the subscales of the AMES (i.e., affective empathy, cognitive empathy, sympathy) and similar and related constructs were investigated. These constructs are sex, empathic concern and perspective taking (as measured by the IRI), prosocial behavior, and physical aggression. Specific hypotheses for each of these constructs were developed.

As studies have consistently demonstrated that females score higher on measures of empathy (Mestre Escriva, Samper Garcia, Frias Navarro, & Tur Porcar, 2009) and sympathy (Lennon, Eisenberg, & Strayer, 1987), female adolescents were expected to score higher than males on all subscales of the AMES.

Empathic concern (EC) as measured with the IRI, is defined as the tendency to experience concern for others' negative experiences (Davis, 1980). Since empathic concern reflects emotional responses to others, we expected that empathic concern would be positively correlated with all subscales of the AMES. Given the focus on concern for others, we expected that empathic concern would be most strongly related to the sympathy subscale of the AMES. Also measured by the IRI, perspective taking is defined as the tendency to adopt and understand the perspective of someone else (Davis, 1980). Since perspective taking measures emotional responses to others, we expected that it would be positively correlated with all subscales of the AMES. However, given the cognitive focus of the cognitive empathy subscale, we expected that perspective taking would be most strongly related to cognitive empathy.

Prosocial behavior refers to a range of positive behaviors including positive interactions (e.g., friendly play or peaceful conflict resolutions), altruism (e.g., sharing, offering help), and behaviors that reduce stereotypes (Mares & Woodard, 2001). Research with adolescents has shown that empathy and sympathy are positively related to prosocial behavior (e.g. Batson, Duncan, Ackerman, Buckley, & Birch, 1981; Malti, Gummerum, Keller, & Buchmann, 2009; Masten, Morelli, & Eisenberger, 2011). As none of these studies have made a distinction between affective and cognitive empathy, we expected that all three scales of the AMES will be positively correlated to prosocial behavior.

Finally, physical aggression is generally defined as harming someone face-to-face through physical attacks. Research, in general, suggests a negative relationship between empathy and physical aggression in adolescents (Kaukiainen et al., 1999; Miller & Eisenberg, 1988). Yet, studies which distinguish between the affective and cognitive components of empathy indicate that the affective component is related to direct aggression whereas cognitive empathy is not (Yeo, Ang, Loh, Fu, & Karre, 2011). Studies investigating the relationship between sympathy and physical aggression in adolescents have also found a negative relationship (Carlo, Raffaelli, Laible, & Meyer, 1999; McGinley & Carlo, 2006). Based on the extant literature, physical aggression was hypothesized to be negatively correlated to affective empathy and sympathy, but unrelated or weakly negatively related to cognitive empathy.

2. Study 1

The aim of Study 1 was to confirm the intended factor structure, to establish the internal consistency of the subscales, and to reduce the number of items to maximize the utility of the scale in adolescents.

2.1. Participants

After receiving approval from the sponsoring institution's review board (European Research Council), a private survey research institute in the Netherlands collected the data. Households with adolescents were recruited in May and June 2012 through an existing online panel (approximately 60,000 households) that is representative of the Netherlands. Data from 499 adolescents (aged between 10 and 15 years old) were collected. The mean age was 12.24 years (SD = 1.58) and 52% was male. Completion of the questionnaire took approximately 24 min. Before completing the online questionnaire, written informed consent was obtained from the participating adolescent and one of their parents. To compensate adolescents, families received points which could be redeemed for prizes provided by the survey company.

2.2. AMES

Based on the aforementioned definitions and on existing empathy scales (BES, CBQ and IRI), a total of 19 items were generated. Care was taken to ensure that: (a) all items were suitable and relevant for adolescents, (b) the emotions mentioned in the items were varied (i.e., anger, sadness, joy and anxiety), and (c) the words used to refer to others in the items were varied (i.e., friend, someone else, people). Seven items were generated to measure affective

Table 1
Factor loadings of the items of the AMES in Study 1.

		Study 1 (N = 499)		
		1	2	3
Factor 1: Cognitive empathy				
1.	I can often understand how people are feeling even before they tell me	.86		
2.	I can tell when a friend is angry even if he/she tries to hide it	.86		
3.	I can tell when someone acts happy, when they actually are not	.75		
4.	I can easily tell how others are feeling	.72		
Factor 2: Affective empathy				
5.	When a friend is scared, I feel afraid		.84	
6.	When my friend is sad, I become sad too		.80	
7.	When a friend is angry, I feel angry too		.57	
8.	When people around me are nervous, I become nervous too		.55	
Factor 3: Sympathy				
9.	I feel sorry for someone who is treated unfairly			.72
10.	I feel concerned for other people who are sick			.63
11.	I am concerned for animals that are hurt			.61
12.	I feel sorry for a friend who feels sad			.57

Factor loadings below .30 are not shown in table. Item numbers correspond to items listed in Fig. 1.

Table 2
Descriptive statistics for AMES in two samples and two studies.

Subscale	Study 1			Study 2		
	$M(SD)_{boys}$	$M(SD)_{girls}$	*Cohen's d*	$M(SD)_{boys}$	$M(SD)_{girls}$	*Cohen's d*
Affective empathy	2.39 (0.65)	2.82 (0.65)**	−0.68	2.72 (0.69)	2.87 (0.57)**	−0.24
Cognitive empathy	2.97 (0.79)	3.34 (0.73)**	−0.47	3.04 (0.72)	3.24 (0.64)**	−0.75
Sympathy	2.59 (0.68)	3.15 (0.78)**	−0.77	3.76 (0.67)	3.89 (0.61)*	−0.21

Independent sample *t*-tests were performed to test statistical differences between boys and girls in Study 1. In study two ANCOVA analyses were performed to correct for social desirability. Negative Cohen's d values indicate higher mean scores for girls.
* $p < .05$.
** $p < .01$.

empathy (e.g. "I feel scared when a friend is afraid"), 6 were generated to measure cognitive empathy (e.g. "I can tell when a friend is angry even if he/she tries to hide it") and 6 were generated to measure sympathy (e.g. "I feel sorry for a friend who is sad"). The instruction was: "We are going to ask you some questions about what you are like and how you normally behave. For each statement, please indicate how often this occurs". The response options were: (1) never, (2) almost never, (3) sometimes, (4) often, and (5) always.

2.3. Results

An Exploratory Factor Analysis (EFA) was carried out to explore the factor structure of the data. Since the data was normally distributed and factors were expected to be correlated, a Maximum Likelihood (ML) estimation procedure was used with a promax rotation method (Costello & Osborne, 2005)[1]. As expected, the analyses resulted in a 3 factor solution explaining 54.4% of the variance. The first factor, explaining 36.1% of the variance, corresponded to the cognitive empathy scale. The second factor, explaining 11.5% of the variance, reflected the affective empathy scale. The third factor, explaining 9.7% of the variance, corresponded to the sympathy scale. To reduce the number of items, the four highest loading items were selected for each factor. The newly-formed 4 item subscales proved to be internally consistent (cognitive empathy $\alpha = .86$, affective empathy $\alpha = .75$, and sympathy $\alpha = .76$). Table 1 presents the twelve-selected items and their factor loadings. Correlations between the factors were, $r = .34$ between affective empathy and cognitive empathy, $r = .39$ between affective empathy and sympathy and $r = .54$ between cognitive empathy and sympathy. Means and standard deviations by subscale and gender are presented in Table 2.

3. Study 2

The goal of Study 2 was to confirm the structure of the 12-item AMES identified in Study 1, to establish test-retest reliability, and to evaluate the construct validity of the AMES.

3.1. Participants

In November 2013, a new and independent sample was recruited by a private research company. Data was collected from 450 adolescents (10–15 years old). The mean age was 12.71 years (SD = 1.58) and 50% was male. After two weeks, all respondents were re-contacted to participate in a follow-up. From the 450 participants in Study 2, a total of 248 (recontact rate 55%) participated in the follow-up. Written informed consent was obtained from the participating adolescents and one of their parents. As in Study 1, compensation was provided in the form of points which could be redeemed for prizes provided by the survey company.

3.2. Materials

3.2.1. IRI

Two subscales of the Dutch version of the IRI (Davis, 1980) were administered: Empathic Concern (EC) and Perspective Taking (PT). The EC subscale is often used to measure the affective component of empathy whereas the PT subscale is often used to measure the

[1] Given the categorical/ordinal nature of the item response options, the Exploratory Factor Analysis was also conducted in Mplus using Weighted Least Squares with Mean and Variance adjustment (WLSMV). The conclusions drawn from this analysis do not differ from the conclusions presented in the manuscript.

Table 3
AMES construct validity.

	Descriptive statistics		Correlation [95% CI]		
	M (SD)	α	Affective empathy	Cognitive empathy	Sympathy
Empathic concern (IRI)	3.48 (0.53)	.63	.29** [.21, .37]	.42** [.34, .49]	.63**[.57, .68]
Perspective taking (IRI)	3.01 (0.53)	.64	.21** [.12, .30]	.45** [.37, .52]	.36** [.28, .44]
Prosocial behavior	2.56 (0.41)	.78	.14** [.05, .23]	.33** [.25, .41]	.50** [.43, .57]
Physical aggression	1.92 (0.85)	.75	−.12* [−.21. −.03]	−.07 [−.02, .02]	−.36** [−.44, −.28]

CI = Confidence Interval.
* $p < .05$.
** $p < .01$.

cognitive component (e.g. Shamay-Tsoory et al., 2009). Both subscales consist of 7 statements to which respondents express their degree of agreement on a 5-point Likert scale ranging from 1 (“Does not describe me well”) to 5 (“Does describe me well”). Items on each subscale were averaged to create an EC score and a PT score. Descriptive statistics on the IRI are presented in Table 3.

3.2.2. Prosocial behavior

To measure prosocial behavior, a subscale of the Dutch self-report version of the Strengths and Difficulties Questionnaire (SDQ) was used (Van Widenfelt, Goedhart,Treffers & Goodman, 2003). This subscale consists of five statements that adolescents rate using a 3-point answering scale (1 = not true, 2 = somewhat true, 3 = certainly true). Example items from this scale are: “I usually share with others, for example CD’s, games, food” and “I am helpful if someone is hurt, upset or feeling ill”. Item scores were averaged to create a scale. Descriptive statistics on this measure are presented in Table 3.

3.2.3. Physical aggression

An adapted version from the Aggression Questionnaire (AQ, Buss & Perry, 1992) was used to measure physical aggression. This subscale consists of 3 items, each of which was answered with a 5-point Likert scale ranging from 1 (“Does not describe me well”) to 5 (“Does describe me well”). For example, “given enough provocation, I may hit another person”. Items were averaged to create a physical aggression score. Descriptive statistics are presented in Table 3.

3.2.4. Sex

Sex was included in the analyses with 1 representing boys and 2 representing girls.

3.2.5. Social desirability

In order to correct for any presentation bias, social desirability was measured with an adopted version of the Marlow-Crowne Social Desirability Scale (Belacchi & Farina, 2012). This scale consisted of 6 items that were rated true or false. For example, “No matter who I am talking to, I am always a good listener”. Items were averaged to create a social desirability score ($\alpha = .57$, $M = 0.52$, $SD = 0.27$).

3.3. Results

3.3.1. Confirmatory factor analyses (CFA)

A CFA using maximum likelihood estimation was performed to evaluate model fit and confirm the structure in the data that was previously identified in Study 1[2]. Three goodness-of-fit-indices were used: the root mean square error of approximation (RMSEA), the Bentler Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI). Generally, CFI and TLI values between .90 and .95 and RMSEA values between .05 and .08 indicate acceptable model fit, and CFI and TLI values larger than .95 and RMSEA values smaller than .05 indicate good model fit (Kline, 2005).

Figure 1 depicts the dimensional structure of our 3-factor hypothesized model for the total sample. Results confirmed the intended 3-factor structure of the AMES. The 12-item scale with a correlated 3-factor structure resulted in an acceptable model fit (RMSEA = .07 (90% [CI]: .06/.08), CFI = .94, TLI = .92). A model with 1 factor resulted in a poor fit (RMSEA = .16 (90% [CI]: .15/.13), CFI = .69, TLI = .62) as well as a model with three uncorrelated factors (RMSEA = .12 (90% [CI]: .11/.13), CFI = .83, TLI = .79). Correlations between the factors were below .80 indicating that there was no multicollinearity and supported discriminant validity of the subscales (Brown, 2006).

3.3.2. Test-retest reliability

Bivariate correlations were used to assess the test-retest reliability of the subscales of the AMES. Test-retest correlations were

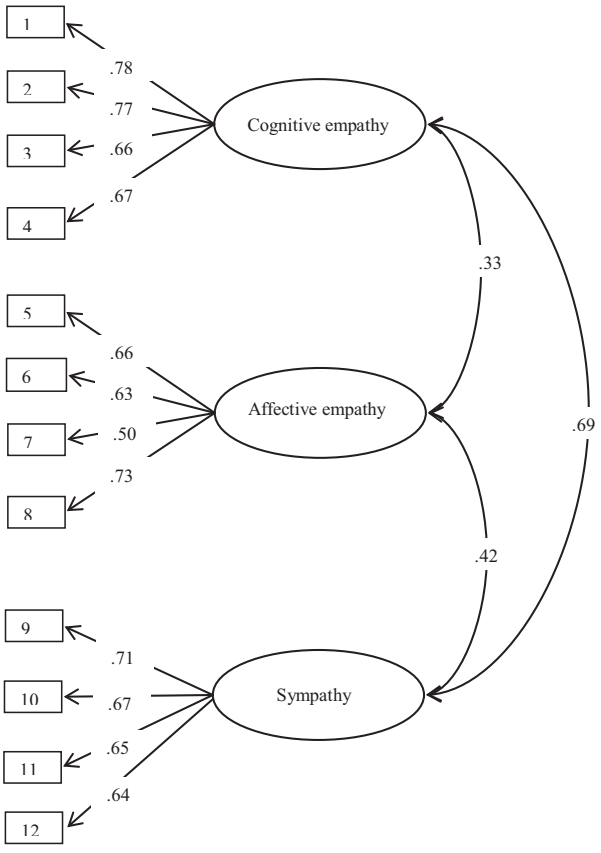

Fig. 1. Confirmatory factor analysis of the total sample based on Study 2 data.

[2] Given the categorical/ordinal nature of the item response options, the Confirmatory Factor Analyses were also performed in Mplus using Weighted Least Squares with Mean and Variance adjustment (WLSMV). The conclusions drawn from this analysis do not differ from the conclusions presented in the manuscript.

r = .56 for affective empathy, r = .66 for cognitive empathy, and r = .69 for sympathy.

3.3.3. Validity of the AMES

First, as expected, ANCOVA correcting for social desirability demonstrated that adolescent girls scored higher on all three subscales of the AMES compared to boys (see Table 2). Partial correlations (correcting for social desirability) were used to assess the relationships between the AMES subscales and the remaining construct validity variables (Table 3). The results demonstrated that, as expected, empathic concern was positively correlated to all subscales but especially strong with the sympathy subscale. Perspective taking was also positively correlated to all subscales of the AMES, and as expected, most strongly with the cognitive empathy subscale. Furthermore, it was hypothesized that all three subscales would be positively related to prosocial behavior. The results confirmed this hypothesis. Lastly, as expected, affective empathy and sympathy were negatively correlated to physical aggressive behavior while cognitive empathy was unrelated to physical aggressive behavior.

4. General discussion and conclusion

The aim of the present study was to develop and validate a new measure of empathy and sympathy for adolescents. The currently available empathy measures often do not clearly distinguish between affective empathy and cognitive empathy, often equate affective empathy with sympathy, and use ambiguous wording. Based on definitions of affective empathy (Mehabrian & Epstein, 1972), cognitive empathy (Hogan, 1969) and sympathy (Clark, 2010), the AMES was developed to address these limitations. The results indicate that the AMES is a reliable and valid measure for adolescents.

4.1. Reliability and validity of the AMES

The results demonstrated satisfactory internal consistency of all three subscales of the AMES. Furthermore, test-retest reliability of the AMES over a two-week period was moderate and consistent with other empathy measures (D'Ambrosio, Olivier, Didon, & Besche, 2009; Davis, 1980). These results support the reliability of the AMES.

Validity was also established for the AMES. In line with previous research (Lennon et al., 1987; Mestre Escriva et al., 2009), females scored higher on all subscales of the AMES in both Study 1 and 2. Furthermore, the empathic concern scale of the IRI was positively related to the AMES and, in particular, to the sympathy subscale. In fact, the correlation between sympathy and empathic concern was more than twice as strong as between affective empathy and empathic concern. This not only verifies that the sympathy subscale actually measures concern for other peoples distress, but also demonstrates that the affective empathy subscale and the sympathy subscale indeed measure distinct constructs. Furthermore, as expected, perspective taking was most strongly correlated to the cognitive empathy subscale. Concerning the relationship between the AMES and prosocial behavior, the results also confirm the expected positive relationship for both empathy and sympathy. Finally, as hypothesized, physical aggression was negatively associated with affective empathy and sympathy and was uncorrelated to cognitive empathy. This result demonstrates that cognitive empathy is, in fact, partly distinct from affective empathy and sympathy.

4.2. Directions for future research

The AMES is certainly not the first measure of empathy. It does, however, have clear additional value over existing scales. First, because the AMES balances affective and cognitive empathy, these two aspects can be investigated independently in relation to other concepts. Research has shown that, although related, affective empathy and cognitive empathy are distinct phenomena. For example, studies have shown that certain personality traits, such as narcissism and psychopathy, are associated with impairments in affective empathy, but not with impairments in cognitive empathy (Wai & Tiliopoulos, 2012). By employing the AMES in future research studies, researchers will be better able to identify whether affective and cognitive empathy influence behavior in different ways.

Second, the AMES is the first scale to distinguish between affective empathy and sympathy. Although empathy and sympathy are related concepts, they are not interchangeable. Sympathy is often conceptualized as an empathy-related behavior, a behavior that occurs after empathy has occurred (Eisenberg, Wentzel & Harris, 1998). Some researchers even suggest that sympathy has a mediating role in the relationship between affective empathy and prosocial behavior (Funk, Fox, Chan & Curtiss, 2008). And yet, while the literature supports distinguishing affective empathy and sympathy, current empirical practices do not reflect this distinction. Rather than measuring affective empathy, most existing studies that purport to measure affective empathy instead are measuring sympathy. This is due to the fact that most existing measures have either confused these concepts or treated these concepts interchangeably (e.g., IRI). As a result, the true effect of affective empathy on behavior remains unknown. The results of this study suggest that sympathy is actually more closely related to adolescent behavior (i.e. prosocial behavior and aggression) than affective empathy. Therefore, sympathy constitutes an important construct to consider in future research on adolescent behavior. The AMES provides researchers an important opportunity to investigate the distinct influence of affective empathy and sympathy on adolescent behavior.

Finally, the AMES is tested in an adolescent sample aged 10 to 15 years. However, because of the unambiguous but not childish wording, we feel this scale can be used with children from 8 years old, late adolescence and even adulthood. This is especially important for longitudinal research. Future research needs to test the psychological properties of the AMES in different age groups.

4.3. Conclusion

The current study demonstrated that the AMES is a reliable and valid measure of empathy and sympathy in adolescents. By distinguishing between affective empathy, cognitive empathy, and sympathy, the AMES provides a distinct advantage over existing measurement tools and can provide important clarification to both former and future research on the role of empathy and sympathy in adolescent behavior.

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