Original Research

The Development and Validation of Teen Beliefs on Relationship Abuse Measure (TBRAM)

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Abstract

The purpose of this study was to validate an original and innovative survey focused on both teens' personal beliefs and how they perceived their peers' beliefs regarding relationship abuse with four research questions: What are the measured constructs in this survey? Is the hypothesized factor structure of the five types of relationship abuse confirmed? Does the validity of constructs vary among racial/ethnic groups and genders? Are there differences between teens' own beliefs on relationship abuse and their perceptions of peers' beliefs? To address these questions, two confirmatory factor analysis (CFA) models were examined with 591 high school students' responses. The first CFA model was created based on the exploratory factor analysis results and the second CFA model was created based on the theoretically hypothesized model of five types of relationship abuse. The results indicate that the 5-factor, 11-item model based on the theoretical hypothesis is the best fit to the data. The multiple group model analysis demonstrated that the identified CFA measurement model was invariant across different gender and racial/ethnic groups. The validated instrument

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of Teen Beliefs on Relationship Abuse Measure is a reliable and valid way to measure both teens' personal beliefs and their perceptions of peers' beliefs on five types of relationship abuse including emotional, physical, sexual, stalking, and digital abuses. With the validated model, t-test results indicate that teens' own beliefs are significantly more positive than their perceptions of their peers' beliefs for all the five factors. The measure is useful for researchers, educators, and parents to measure and understand teen perceptions of themselves and their peers on different types of relationship abuses to better support them develop healthy, respectful, and nonviolent relationships.

Keywords

Teen relationship abuse is a type of intimate partner violence (IPV) occurring between two adolescents in a close relationship and affects millions of teens each year (Center for Disease Control and Prevention, 2019; Smith et al., 2018). The Bureau of Justice Statistics defines IPV as various types of violence committed by a victim's current or former spouse, boyfriend, or girlfriend (Catalano, 2013). For teen victims, intimates can refer to boyfriends and girlfriends, or perceived romantic relationships as friends or acquaintances (Catalano, 2013). The National Intimate Partner and Sexual Violence Survey (NISVS) identified four types of IPV including sexual violence, stalking, physical violence, and psychological aggression (Smith et al., 2018). The results of NISVS indicate that IPV experienced as a child or adolescent can be a significant risk factor for repeated victimization as an adult and it is associated with chronic physical and psychological adverse health conditions (Smith et al., 2018). Unhealthy, abusive, or violent relationships have negative effects on teens, such as depression and anxiety, unhealthy behaviors, antisocial behaviors, suicide, and many other aspects in their future relationships and lives (Center for Disease Control and Prevention, 2019). The purpose of the research is to examine the internal structural validity of a survey about teen beliefs and how they perceive their peers' beliefs on relationship abuse. The validated measure of this study is useful for schools and parents to understand teen's beliefs and perceptions of relationship abuse and support in developing healthy, respectful, and nonviolent relationships.

Physical, emotional, sexual, stalking, and digital abuses are the identified types of abuse among teens (The Conflict Center, 2019; "Love Is Respect," 2019; Murray, 2019; National Domestic Violence, 2019) . Psychological or

emotional abuse is the most common type of abuse for youth; physical, sexual, and stalking abuse follow (Niolon et al., 2015; Taylor & Mumford, 2016). According to Niolon et al.'s (2015) study on 2,895 middle school students in the United States, 77% of the students had perpetrated emotional or psychological abuse, 32% reported experiences of perpetrating physical abuse, 15% reported sexual abuse, and 6% reported stalking. In addition, Niolon et al. (2015) identified significant differences between girls and boys in regard of abuse types such as verbal/emotional abuse, physical abuse, and sexual abuse. For example, more girls reported perpetrating emotional and physical abuse, but boys reported more sexual abuse perpetrating. Taylor and Mumford's (2016) study on the National Survey on Teen Relationships and Intimate Violence, which is the first nationally representative household survey focused on adolescent relationship abuse, also suggested that psychological abuse was most common type of teen relationship abuse for over 60% youth, sexual abuse (18%) and physical abuse (18%) followed. Similarly, Taylor and Mumford (2016) also found that girls perpetrated more physical and psychological abuse than boys. However, they did not find significant differences of adolescent relationship abuse by race/ethnicity, geographic region, urbanicity, and household characteristics. Therefore, Taylor and Mumford (2016) suggested that universal prevention programs were needed and important.

Relationship abuse or violence can also take place electronically through the internet and digital media (Center for Disease Control and Prevention, 2012; Hellevik, 2019; Murray, 2019). Hellevik (2019) pointed out that knowledge about the digital IPV and abuse was limited compared to other in-person intimate partner abuse types among teens, such as physical, sexual, and psychological violence, which have been widely studied in previous literature. Digital abuse, like cyberbullying, among dating teens has become another serious problem in recent years and can cause significant harms to teen victim's mental well-being (Lucero et al., 2014; Murray, 2019). Lucero et al. (2014) identified that texting and social networking were the two most common types of socially interactive technology or digital abuse, and the most common technology/digital abusive actions included spying/monitoring, sexting, and password sharing/account access. Lucero et al. (2014) also indicated that female and male teens had differences in their perspectives on technology/digital abuse. For example, male teens emphasized the appropriateness of sexting within relationship bounds, while female teens discussed more about the appropriateness of password sharing and account access. Both males and females agreed that some digital abusive behavior were common and typical in adolescent dating experiences. Hellevik's (2019) qualitative study suggested that that digital abuse was multifaceted with severe

impact on teens' lives through both direct and indirect attacks on or off social networks. Digital abuse can co-occur with in-person intimate partner abuse, and digital abuse and in-person abuse have many similar characteristics. Both Hellevik (2019) and Lucero et al. (2014) indicated that jealousy, distrust, and insecurity were important factors that influenced teens' perspectives and experiences of digital abuse. Hellevik (2019) suggested that possible prevention could be conducted by teaching teens what a healthy and positive intimate relationship, intimacy, and sexuality should be like on the internet or social media. The following definitions of the five types of relationship abuse were used for this study:

1. Emotional/psychological abuse: The use of verbal and non-verbal communication with the intent to har another person mentally or emotionally and/or exert control over another person (Center for Disease Control and Prevention, 2019).
2. Physical abuse: When a person hurts or tries to hurt a partner by hitting, kicking, or using another type of physical force (Center for Disease Control and Prevention, 2019).
3. Sexual abuse: Forcing or attempting to force a partner to take part in a sex act, sexual touching, or a non-physical sexual event (e.g., sexting) when the partner does not or cannot consent (Center for Disease Control and Prevention, 2019).
4. Stalking abuse: A pattern of repeated, and unwanted attention and contact by a partner that causes fear or concern for one's own safety or the safety of someone close to the victim (Center for Disease Control and Prevention, 2019).
5. Digital abuse: Spying/monitoring, sexting, password sharing/account access, excessive texting or calling (Lucero et al., 2014; Murray, 2019).

It is important to understand teen perceptions of appropriate behaviors and how they perceived peers' beliefs. Most teens believe that some abusive actions are typical or common in adolescent dating experience (Lucero et al., 2014). Many teens want to engage in positive relationships, but they believe peers engage in negative behaviors (National Social Norms Center, 2020). Keller and Bauerle (2009) found that many young people were likely to overestimate unhealthy behaviors, but underestimate healthy and protective behaviors among peers. They defined this type of behavior as *misperception* indicating, "perceptual bias in favor of the unhealthy behavior then predisposes people to engage in the unhealthy behavior themselves" (p. 89). Thus, many teens tend to do wrong things to gain acceptance by their peers (National Social Norms Center, 2020). Selikow et al. (2009) suggested that positive

peer education, or positive peer pressure, with a role model can be helpful to increase and build healthy social norms. It is helpful to reduce negative or harmful behaviors in teen relationships when they have an accurate perception of their peers' beliefs regarding positive behaviors in relationships; this is known as *positive peer pressure* (The Conflict Center, 2019).

Many previous research studies have focused on teens' attitudes, perceptions or experiences related to relationship violence or abuse (e.g., Jain et al., 2018; Josephson & Proulx, 2008; Lucero et al., 2014; Taylor & Mumford, 2016; Temple et al., 2013). A few studies have validated or developed measures of relationship abuse (e.g., Beck et al., 2013; Shorey et al., 2019; Wolfe et al., 2001). Shorey et al. (2019) tested and validated the Conflict in Adolescent Dating Relationship Inventory (CADRI; Wolfe et al., 2001), the most commonly used measurement of adolescent IPV, on its five factors including threatening, verbal/emotional, relational, physical, and sexual. The CADRI was examined to be appropriate across sex, race/ethnicity, and time for all five factors. Beck et al.'s (2013) Relationship Behavior Rating Scale - Revised is another widely used measure of intimate partner abuse, but it only measures three factors of psychological, physical and sexual abuse. We found none have used or developed a scale to measure teen beliefs on digital abuse, nor all the five different types of relationship abuses including physical, emotional, sexual, stalking, and digital abuses, and there was no instrument measuring *both* personal perceptions and perceptions of peers' beliefs in one scale. Therefore, the purpose of this measurement study was to develop a unique survey instrument that could contribute to the existing IPV literature assessing teen's perceptions of IPV.

Methods

This study sought to validate an original and unpublished survey instrument about teens' own beliefs versus their perceptions of peers' beliefs of relationship abuse created by the Conflict Center using a measure validation methodology. DeVellis (2003) outlines this process in four stages: planning, construction, quantitative evaluation, and validation. The planning and construction phases were done internally by the organization. The survey items were designed by the Conflict Center intended to measure five types of teen relationship abuse. Multiple IPV and social norming experts across the country designed the items based on the theory of social norms approach developed by the National Social Norms Center. However, the items were not grouped by the five types of abuse in the survey format and were never examined as comprehensive factors. Therefore, this study is needed to address the quantitative evaluation stage in DeVellis' (2003) framework to assess whether

the five-factor structure or another structure would best model the constructs of abuses. This is a unique opportunity to assess a tool being used in an evaluation setting to ensure it is working as intended while offering it as a tool for others to use. The major limitation in this is that the sample was bounded by the organization's program goals of working with highly Latinx schools in urban settings. This article begins the validation work on the measure with the hope that others will continue the validity stage through future studies with new samples. Thus, this study examined four research questions:

1. RQ 1: What are the measured constructs in this survey?
2. RQ 2: Is the hypothesized factor structure of the five types of relationship abuse (physical, emotional, sexual, stalking, and digital) confirmed?
3. RQ 3: Does the validity of constructs vary among racial/ethnic groups and genders? Can the measurement invariance be established for the final model identified from RQ 1 & 2?
4. RQ 4: Are there statistically significant differences between teens' self-beliefs on the appropriateness of relationship abuse and their perceptions of peers' beliefs?

Data Collection

This study used pre-collected data by the Conflict Center in 2017–2018 from two urban high schools. Each school has about 400 students. One school in this data set began less than 10 years ago in an effort to reduce violence and increase graduation rates in Northeast Denver schools. Their approach was becoming an early college and getting students interested in career paths and getting college credits earlier on in their education. This school has a large proportion of immigrant students and their priority is to ensure every student has an opportunity to learn English. The other school is located in Northwest Denver in a gentrified area. It was once a choice school with an application process that brought in students from all over Denver, which has shifted to a neighborhood school, creating a divide among students that attend the school. They also happen to be an early college with most students enrolled in college classes or receiving college credit as well.

Convenience sampling method was used for the data collection (Gliner et al., 2011). For both schools, the survey was optional to students with incentives to take the survey. The incentives for students to complete the survey included headphone wraps, stickers, or chips. The survey was taken during the school day in place of a class. The survey was disseminated via paper and trained proctors. Students were not specifically chosen out, everyone in the school had opportunity to take the survey. In total, there were about 800

students in the two participated high schools. In 2017, there was a 38% response rate, yielding 300 total survey responses. In 2018, there was a 36% response rate, yielding 291 total survey responses.

For this current study, school and district identifiers were removed before the researchers had access to it. All student responses were anonymously collected. As this data was being collected and used for the organization's evaluation purposes, limited student demographics were collected, and the sites were not intended to collect data on a mixed demographic sample. Institutional research board approval was given for this study from the authors' institution.

Participants

A total of 591 high school students between 9th and 12th grade (aged between 14 and 18 years) responded to the survey. Table 1 presents the demographic information of the participants. Specifically, there were 54.8% male, 43.5% female, 0.5% transsexual, and 1.0% others. In regard of racial and ethnic identities, there were 72.4% Hispanic, Latino, or Spanish origins as the majority of the participants, 13.0% Black/African American/African decent, 5.6% White, 3.4% Multiracial, 1.4% Asian American or Pacific Islander, 0.8% American Indian/Native American/First Nations/Indigenous, 0.7% Arab/Middle Eastern, and a few respondents selected others (1.2%). In regard of sexual orientations, there were 88% straight/heterosexual, 7.6% bisexual, 1.7% questioning/unsure, 0.3% gay, 0.3% queer, and 0.2% lesbian. For the question about sex active experience, 45.3% of the participants indicated yes, and 54.1% indicated no.

Instrument

Two scales about teens' beliefs on appropriateness of relationship behaviors were analyzed: (a) AIB scale: How appropriate *I* believe scale (Cronbach's α = 0.88); (b) APB scale: How appropriate I think *peers* believe scale (Cronbach's α = 0.95). The items include examples of relationship abuse among teens, for example: "Grab, shove, punch or kick someone to hurt them, not to be playful," "Threaten to hurt someone else," or "Make unwanted sexual comments/gestures toward someone else." The items and scales are identical for AIB and APB: 1 = Ok, 2 = A little bit ok, 3 = Not ok, and 4 = Never ok with higher responses indicating more positive beliefs regarding relationship behaviors. Table 2 and Table 3 present the items in original AIB and APB scales.

Table 1. Participant Demographic Information (n = 591).

Demographic	Number of Participants (%)
Grade in school	9th grade = 186 (31.5%) 10th grade = 152 (25.7%) 11th grade = 131 (22.2%) 12th grade = 121 (20.5%) No response = 1 (0.2%)
Gender	Female = 257 (43.5%) Male = 324 (54.8%) Transsexual = 3 (0.5%) Other = 6 (1.0%) No response = 1 (0.2%)
Racial and ethnic identity	Arab/Middle Eastern = 4 (0.7%) American Indian/Native American/First nations/Indigenous = 5 (0.8%) Asian American or Pacific Islander = 8 (1.4%) Black/African American/ African Decent = 77 (13.0%) Hispanic, Latino, or Spanish origin = 428 (72.4%) White = 33 (5.6%) Multiracial = 20 (3.4%) Other = 7 (1.2%) No response = 9 (1.5%)
Sexual orientation	Bisexual = 45 (7.6%) Gay = 2 (0.3%) Lesbian = 1 (0.2%) Straight/Heterosexual = 520 (88.0%) Queer = 2 (0.3%) Questioning/Unsure = 10 (1.7%) No response = 11 (1.9%)
Sex active	Yes = 268 (45.3%) No = 320 (54.1%) No response = 3 (0.5%)

Data Analysis

To address the first research question, "What are the measured constructs in this survey?" an exploratory factor analysis (EFA) and a confirmatory factor analysis (CFA) were conducted using a randomly split data by SPSS in two steps: first, EFA was conducted on one sub-sample (n = 304) to identify the number of factors to retain and how items fit into factors using principle components analysis (PCA) with varimax rotation and then a CFA model was examined to confirm if the factor-structure identified by EFA was a good fit to the data on the other sub-sample (n = 287). The split data method was

based on the recommendation that measurement model development should begin model generation using EFA on a sample/sub-sample of data to explore and determine latent factors in a plausible model, and then use another sample/sub-sample of data to confirm or test model using CFA (Costello & Osborne, 2005; Jöreskog, 1969; Schumacker & Lomax, 2016).

To address the second research question, "Is the hypothesized factor structure of the five types of relationship abuse confirmed?" the second CFA model was created based on our hypothesis of the five types of relationship abuse as the intended factors and then conducted with the whole sample (*n* = 591). AIB and APB scales were analyzed separately. CFA was conducted with IBM SPSS AMOS 25 (Arbuckle, 2017) using raw scores. Full-information maximum likelihood estimation was used to handle missing data. Model fit was assessed using chi-square, the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). CFI compares the theoretical model to a null model and is considered sufficient with values of .90 and above (Bentler & Bonett, 1980); RMSEA is sensitive to parsimony of the model with values of .10 and below considered acceptable (Browne & Cudeck, 1992). Then the two CFA models' results were compared to assess which factor-structure had better model fit to the data: the EFA-CFA model or the hypothesized-CFA model?

Once the measurement model was identified based on the previous steps, to address the third research question, "Does the validity of constructs vary among racial/ethnic groups and genders?", multiple group model analysis was conducted on racial/ethnic groups and genders to examine the construct validity and measurement invariance (Schumacker & Lomax, 2016). To assess that if the data for each group fit the same measurement model, or if the constructs are the same for each group, Schumacker and Lomax's (2016) method for multiple group model analysis was used: the separate models for each group (i.e., gender, race/ethnicity) were run and compared to assess the data to model fit using chi-square, CFI and RMSEA. Because the sample is predominantly of Hispanic, Latino, or Spanish descent, the data were separated to two data sets of (a) Hispanic, Latino, or Spanish origin (*n* = 428) and (b) all other non-Hispanic/Latino/Spanish racial/ethnic groups (*n* = 154) to assess if this affects the instrument validation and generalization. Regarding genders, only female (*n* = 257) and male (*n* = 324) groups were tested due to the insufficient sample sizes of transsexual and other groups (Arbuckle, 2017). Schumacker and Lomax (2016) suggested that it was possible that two separate group models' fit indices might not be exactly the same, but the factor loadings should be similar in the measurement model for the compared groups, so the factor loadings of each item were further compared to establish the measurement invariance.

To address the last research question, "Are there differences between teens' beliefs on the appropriateness of relationship abuse and their perceptions of peers' beliefs?" paired samples t tests were conducted to determine if the teens' personal beliefs (AIB) were more positive or negative than their perceptions of peers' beliefs (APB) regarding the different types of relationship abuse. In our data set, each participant has a pair of scores on the identical items of AIB and APB. In order to compare teens' beliefs on each factor instead of each item, a new variable of the overall score for each factor was computed using the mean score of the items for that factor using the best/final model identified in the CFA results. The overall scores for each factor were used to conduct the paired samples t tests. Assumptions for paired samples t test were checked and met, including: (a) the independent variable is dichotomous and its levels are paired or matched (i.e., "How I believe" versus "How I think peers believe"); and (b) the dependent variable is normally distributed in the two conditions with the skewness between –1 and 1 (Morgan et al., 2012).

Hypothesized CFA Model

The hypothesized model was created based on the five types of relationship abuse. The items were grouped into five factors based on the content of each item by the researchers. Items 2, 3, 4, 5, and 7 could be interpreted within multiple constructs so cross loadings were examined. Item 10 was not conceptually related to any of the five types of relationship abuse (physical, emotional, sexual, stalking, and digital), thus it was removed from the measure. Then the hypothesized 5-factor 14-item CFA model was established (Figure 1).

Results

EFA-CFA Models

PCA with AIB items showed three factors based on the eigenvalues over 1 (Table 2). Factor 1 consists of eight items: AIB 1, 2, 3, 4, 5, 6, 7, and 8. Factor 2 consists of five items: AIB 8, 11, 12, 13, and 14. Factor 3 consists of five items: AIB 3, 4, 9, 10, and 15. Items 3, 4, 8 are cross loaded on two factors, but they were kept and tested in the next CFA model. CFA was used to assess whether the three-factor model for the AIB scale that identified from EFA results fit the data from an independent sample. This model showed acceptable fit to the data, χ^2 (84) = 255.02, p < .001; RMSEA = .08; CFI = .91. However, Item AIB 3, 4, and 8 were cross loaded on two factors. The paths
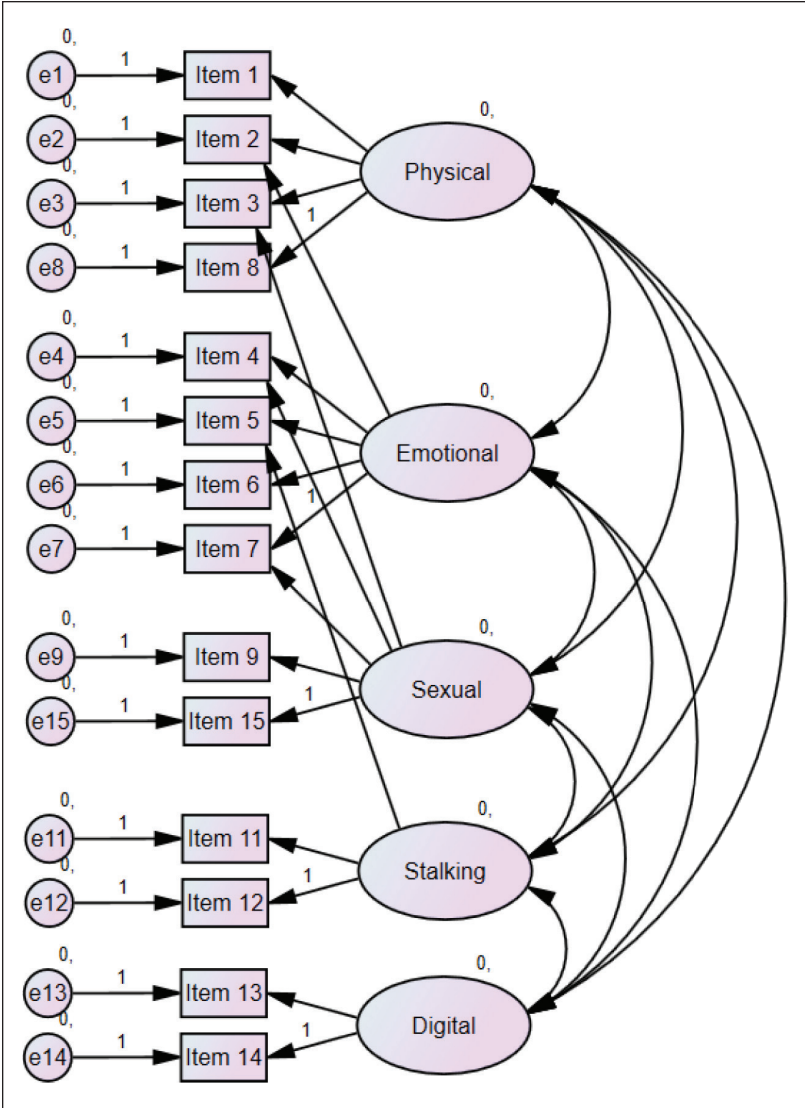
Figure 1. Hypothesized five-factor CFA model.

with a factor loading less than .40 were removed. The model without these cross-loaded items was rerun. The revised AIB three-factor model (AIB

Table 2. AIB Items Component Loadings for the Rotated Components (n = 304).

		Component Loading		
Item#	Item	1	2	3
AIB_1	Grab, shove, punch or kick someone to hurt them, not to be playful.	.77		
AIB_2	Threaten to hurt someone else.	.83		
AIB_3	Make unwanted physical sexual advances (grabbing, touching, kissing) toward someone else.	.57		.52
AIB_4	Make unwanted sexual comments/gestures toward someone else.	.58		.58
AIB_5	Repeatedly ask to get together with someone who has already said no.	.59		
AIB_6	Publicly rate or label someone else's attractiveness.	.58		
AIB_7	Making jokes about someone's sexuality (such as "that girl is a slut" or "that guy is a fag")?	.63		
AIB_8	Hurt someone who is flirting with your boyfriend/girlfriend?	.62	.43	
AIB_9	Asking a partner to prove their love by having sex.			.71
AIB_10	Requiring a partner to pay for all the dates.			.59
AIB_11	Drive by or show up at a partner's house or work unannounced.		.67	
AIB_12	A partner must share their location when asked.		.76	
AIB_13	Read a partner's messages and/or go through their phone.		.81	
AIB_14	Require a partner to share passwords.		.83	
AIB_15	Refuse to use condoms/birth control even when a partner wants to.			.76
Eigenvalue		5.42	2.05	1.34
% of VAR		36.12	13.70	8.91

Note. AIB survey question was "Based on your experience, indicate how appropriate you believe it would be okay to". Factor loadings less than 0.40 were omitted to improve clarity (Comrey & Lee, 1992).

Model 1; Figure 2) showed an acceptable fit, χ^2 (87) = 281.25, p < .001; RMSEA = .09; CFI = .90.

PCA with APB items showed two factors with eigenvalues above 1 (Table 3). Factor 1 consists of ten items: APB 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10; Factor 2 consist of seven items: APB 9, 10, 11, 12, 13, 14, and 15. Item 9 and 10 are
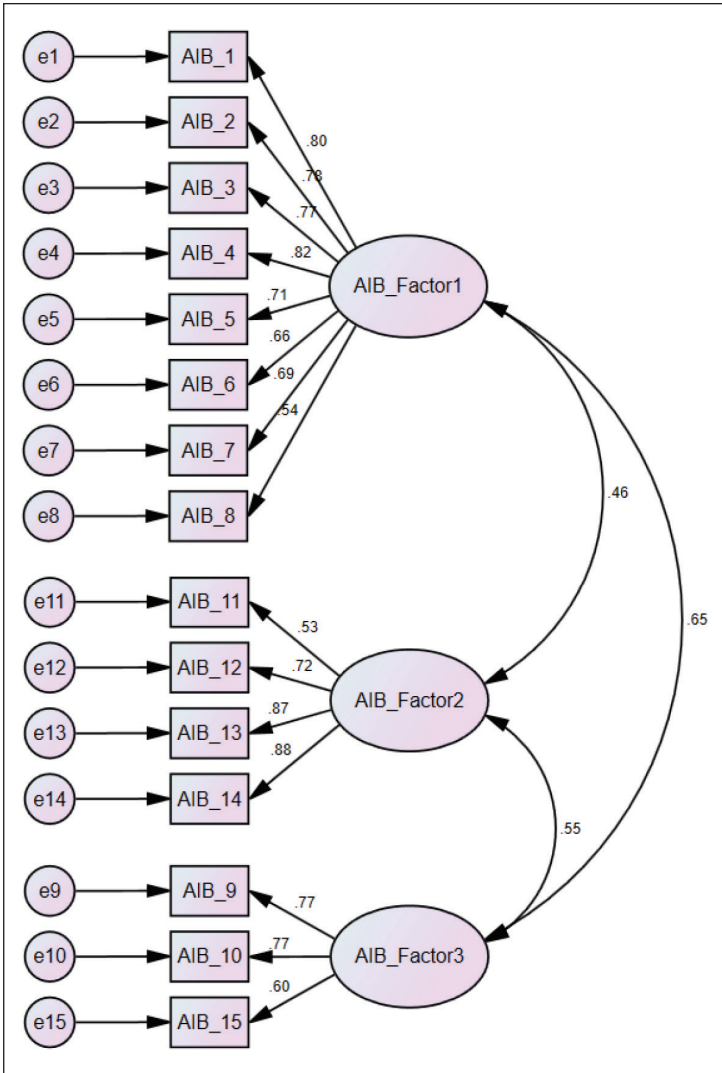

Figure 2. AIB Model 1: AIB three-factor CFA model based on EFA results.

Table 3. APB Items Component Loadings for the Rotated Components (n = 304).

Item#	Item	Component Loading 1	Component Loading 2
APB_1	Grab, shove, punch or kick someone to hurt them, not to be playful.	.84	
APB_2	Threaten to hurt someone else.	.86	
APB_3	Make unwanted physical sexual advances (grabbing, touching, kissing) toward someone else.	.80	
APB_4	Make unwanted sexual comments/gestures toward someone else.	.82	
APB_5	Repeatedly ask to get together with someone who has already said no.	.75	
APB_6	Publicly rate or label someone else's attractiveness.	.77	
APB_7	Making jokes about someone's sexuality (such as "that girl is a slut" or "that guy is a fag")?	.78	
APB_8	Hurt someone who is flirting with your boyfriend/girlfriend?	.69	
APB_9	Asking a partner to prove their love by having sex.	.44	.71
APB_10	Requiring a partner to pay for all the dates.	.43	.70
APB_11	Drive by or show up at a partner's house or work unannounced.		.84
APB_12	A partner must share their location when asked.		.89
APB_13	Read a partner's messages and/or go through their phone.		.88
APB_14	Require a partner to share passwords.		.87
APB_15	Refuse to use condoms/birth control even when a partner wants to.		.61
Eigenvalue		8.74	2.04
% of VAR		58.25	13.57

Note. APB survey question was "Based on your experience, indicate how appropriate your *peers* at school believe it would be okay to". Factor loadings less than 0.40 were omitted to improve clarity (Comrey & Lee, 1992).

cross loaded. CFA assessed the two-factor model for the APB scale but showed less ideal fit, χ^2 (87) = 398.01, $p < .001$; RMSEA = .11; CFI = .90. Item APB 9 and 10 were cross loaded on two factors and were removed. The revised model (APB Model 1; Figure 3) had worse fit, χ^2 (89) = 450.23, $p < .001$; RMSEA = .12; CFI = .89.
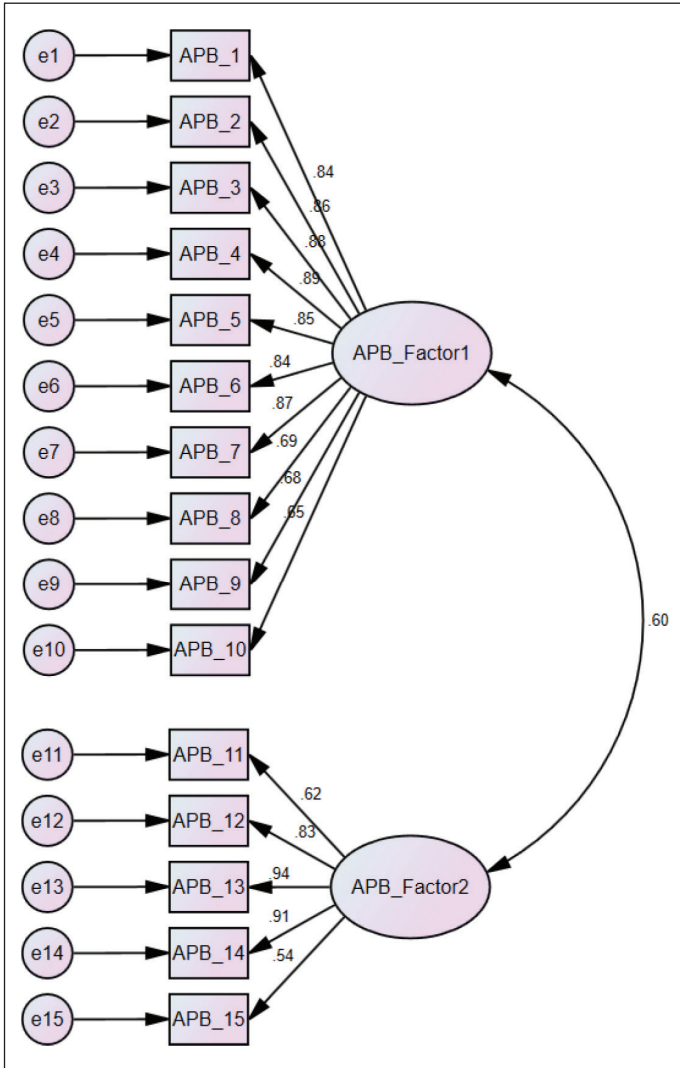

Figure 3. APB Model 1: APB two-factor CFA model based on EFA results.

Hypothesized Models

The hypothesized five-factor CFA model for AIB scale was conducted. This model showed acceptable fit to the data, $\chi^2 (62) = 302.80$, $p < .001$; RMSEA $= .08$; CFI $= .93$. However, Item AIB 2, 3, 4, 5, and 7 were cross loaded on multiple factors based on item content. The non-significant paths and paths with a factor loading below .40 were removed. The model was rerun without
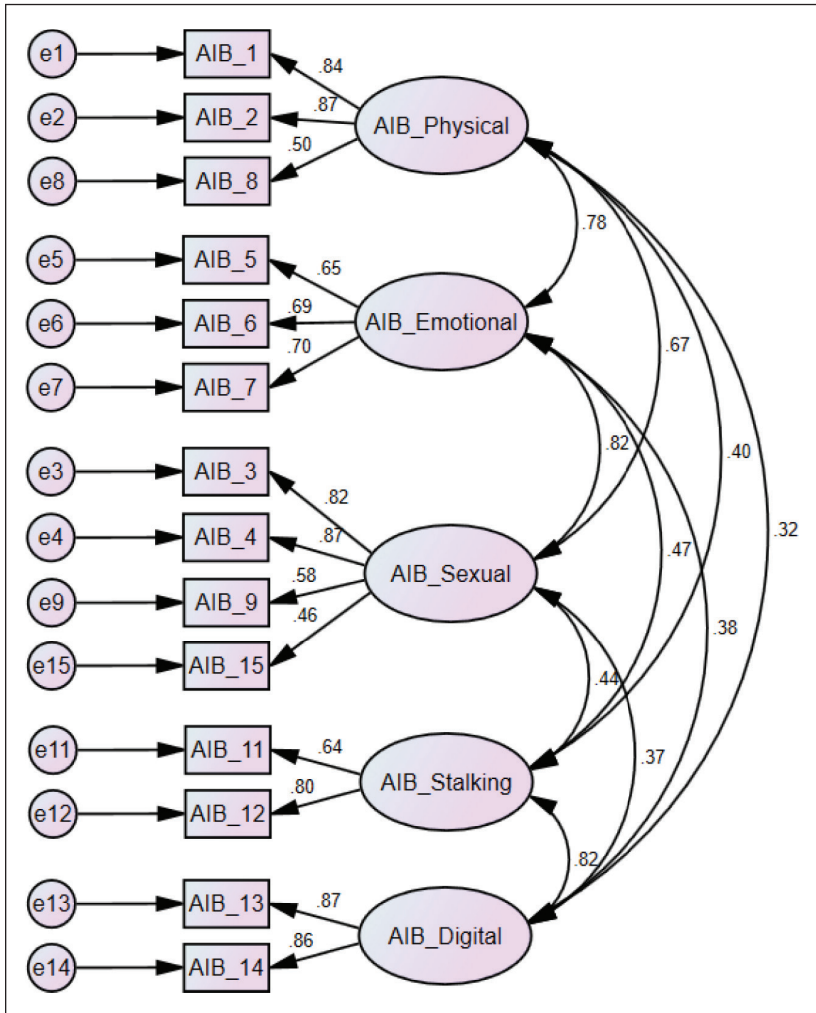

Figure 4. AIB Model 2: AIB 5-factor model with 14 items.

these paths. The revised model with 14 items (AIB Model 2; Figure 4) was a good fit, χ^2 (67) = 329.56, $p < .001$; RMSEA = .08; CFI = .92.

The hypothesized five-factor CFA model for APB scale showed acceptable, χ^2 (62) = 428.16, $p < .001$; RMSEA = .10; CFI = .94. When removing cross-loaded, non-significant paths and the paths with a factor loading below 0.4, the revised model with 13 items (APB Model 2; Figure 5) was good fit to the data: χ^2 (55) = 348.72, $p < .001$; RMSEA = .10; CFI = .95.
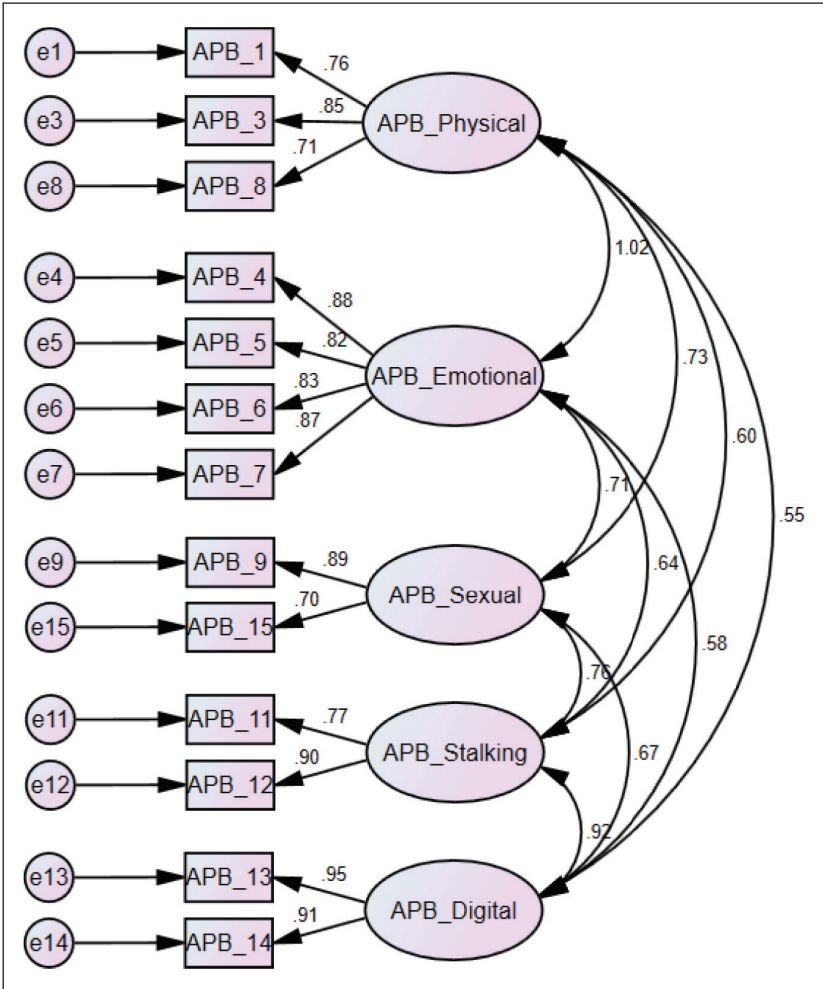

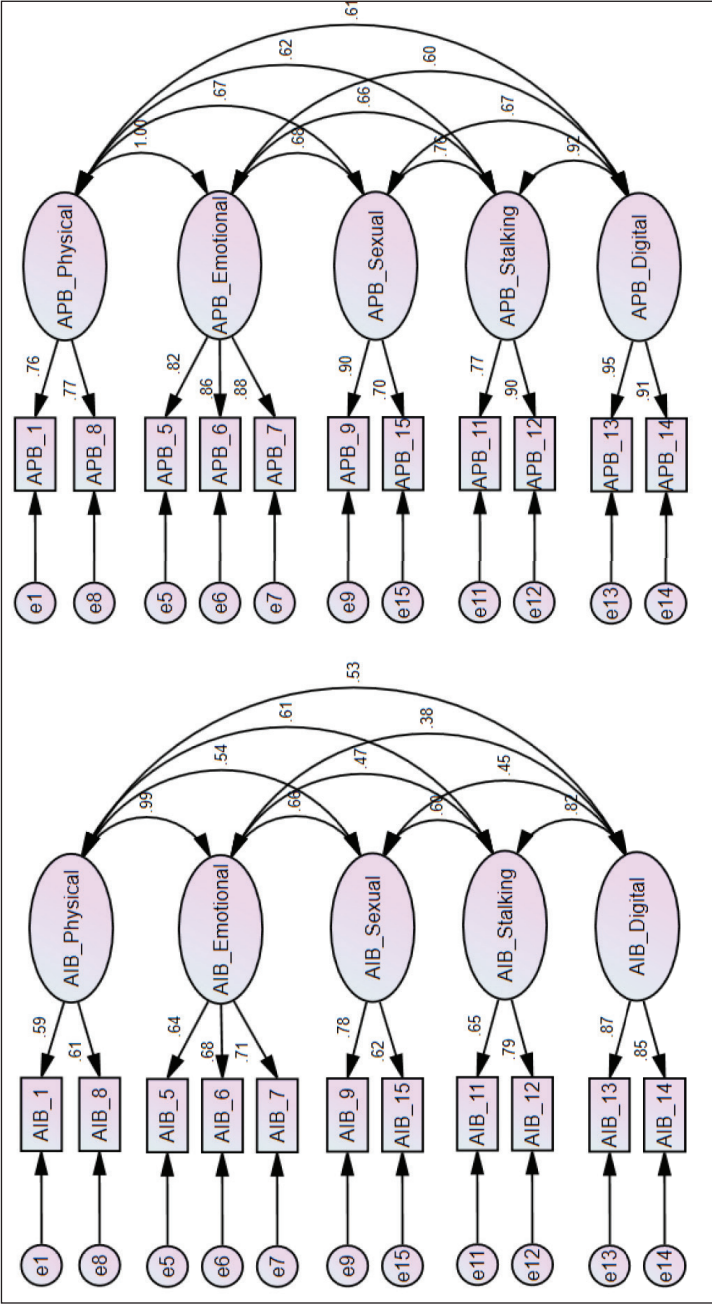**Figure 5.** APB Model 2: APB 5-factor model with 13 items.

Figure 6. AIB Model 3 (left) and APB Model 3 (right): Identical 5-factor models with 11 items for AIB and APB.

In order to develop a matched and identical measure for both AIB and APB scales, only the items that consistently showed good fit with the same factor in both models were kept for the final models. Item 2, 3, and 4 were not consistently good fit, so these three items were removed. The new 5-factor model with 11 items was created and tested for both AIB and APB scales (AIB & APB Model 3; Figure 6). The identical 11-item AIB model demonstrated better model fit, χ^2 (34) = 96.86, $p < .001$; RMSEA = .06; CFI = .97, as did the APB model, χ^2 (34) = 116.12, $p < .001$; RMSEA = .06; CFI = .98.

Model Comparison

Table 4 compares the six CFA models tested. Among these models, AIB Model 3 and APB Model 3 showed best model fits to the data. Moreover, these two models have the identical 5-factor structure with 11 items indicating five types of relationship abuse (physical, emotional, sexual, stalking, and digital), which is supported by the hypothesized five abuse factors.

Measurement Invariance

The final CFA measurement model of AIB and APB (Model 3; Figure 6) was tested on each gender and racial/ethnic group. Specifically, the AIB and APB Model 3 was rerun with two sub-samples of gender (i.e., female, male), and two sub-samples of race/ethnicity (i.e., Hispanic/Latino/Spanish origin, Non-Hispanic/Latino/Spanish) respectively. The results indicate that all sub-groups fit the model well at acceptable to excellent levels, meaning that the identified CFA measurement model for both AIB and APB was invariant across different gender and racial/ethnic groups.

"I Believe" AIB Model

The results in Table 5 indicate that both the females and males' data fit the AIB final model well with χ^2 (34) = 78.12, $p < .001$; RMSEA = .07; CFI = .94 for the female group, and χ^2 (34) = 66.21, $p = .001$; RMSEA = .05; CFI = .97 for the male group. Upon further inspection, all the factor loadings of each item for females and males were similar with small differences ranged from 0 to 0.18. This indicates that the females and males do not show a difference in the constructs. Both the Hispanic/Latino/Spanish and other race/ethnicity groups' (non-Hispanic/Latino/Spanish) data fit the AIB model well with χ^2 (34) = 69.92, $p < .001$; RMSEA = .05; CFI = .97 for the Hispanic/Latino/Spanish group, and with χ^2 (34) = 70.20, $p < .001$; RMSEA = .08; CFI = .94 for the other race/ethnicity group, meaning that the two groups do not show a

Table 4. Model Comparison.

Model #	Factor	Number of Items	EFA Supported	Theory Supported	AIB & APB Identical?	Chi-Square	CFI	RMSEA
AIB 1	3	15	Yes	No	No	281.25	.90	.09
AIB 2	5	14	No	Yes	No	329.56*	.92	.08
AIB 3	5	11	No	Yes	Yes	96.86*	.97	.06
APB 1	2	15	Yes	No	No	450.23*	.89	.12
APB 2	5	13	No	Yes	No	348.72*	.95	.10
APB 3	5	11	No	Yes	Yes	116.12*	.98	.06

Note. *$p < .001$; CFI compares the theoretical model to a null model and is considered sufficient with values of .90 and above (Bentler & Bonett, 1980); RMSEA is sensitive to parsimony of the model with values of .10 and below considered acceptable (Browne & Cudeck, 1992).

difference in the constructs. All the factor loadings of each item for the Hispanic/Latino/Spanish and other race/ethnicity groups were similar with small differences ranged from 0.01 to 0.21. Although the groups of male and Hispanic/Latino/Spanish fit the model slightly better than the groups of female and non-Hispanic/Latino/Spanish due to the larger sample sizes, all sub-groups showed acceptable to good fit, indicating that the measurement invariance was established for the AIB Model 3.

"Peers Believe" APB Model

The results in Table 6 indicate that both the females and males' data fit the APB final model well with χ^2 (34) = 79.97, p < .001; RMSEA = .07; CFI = .97 for the female group, and χ^2 (34) = 67.64, p = .001; RMSEA = .06; CFI = .98 for the male group. All the factor loadings of each item for females and males were similar with small differences ranged from 0 to 0.16. This indicates that the females and males do not show a difference in the constructs. Both the Hispanic/Latino/Spanish and other race/ethnicity groups' (non-Hispanic/Latino/Spanish) data fit the APB model well with χ^2 (34) = 73.22, p < .001; RMSEA = .05; CFI = .99 for the Hispanic/Latino/Spanish group, and with χ^2 (34) = 82.94, p < .001; RMSEA = .10; CFI = .95 for the other race/ethnicity group, meaning that the two groups do not show a difference in the constructs. All the factor loadings of each item for the Hispanic/Latino/Spanish and other race/ethnicity groups were similar with small differences ranged from 0 to 0.16 Although the groups of male and Hispanic/Latino/Spanish fit the model slightly better than the groups of female and non-Hispanic/Latino/Spanish due to the larger sample sizes, all sub-groups showed acceptable to good fit, indicating that the measurement invariance was established for the APB Model 3.

Comparison of Means Between "I Believe" and "My Peers Believe"

Paired samples t tests indicated that the teens' personal beliefs on all the five factors of relationship abuse were on average significantly more *positive* than their perceptions of peers' beliefs at 95% confidence level (Table 7). The difference between AIB and APB mean scores for the Emotional factor is a medium-high effect size using Cohen's (1988) guidelines, t (513) = 12.82, p < .001, d = .67. The differences of Sexual, Physical, and Digital factors, although statistically significant, are considered small-medium effect sizes with Cohen's d ranging from 0.30 to 0.45. The difference for Stalking factor

Table 5. Comparison of AIB Measurement Model "I Believe It Would Be Okay To" by Gender and Race/Ethnicity.

Factor	Item	Global (n = 591) Factor loading	Female (n = 257) Factor loading	Male (n = 324) Factor loading	Hispanic/Latino/ Spanish origin (n = 428) Factor loading	All Other Race/ Ethnicity (n = 154) Factor loading
Physical	AIB_1 Grab, shove, punch or kick someone to hurt them, not to be playful	.59	.52	.62	.54	.65
	AIB_8 Hurt someone who is flirting with your boyfriend/ girlfriend	.61	.56	.62	.65	.54
Emotional	AIB_5 Repeatedly ask to get together with someone who has already said no	.64	.64	.65	.62	.69
	AIB_6 Publicly rate or label someone else's attractiveness	.69	.60	.71	.67	.71
	AIB_7 Making jokes about someone's sexuality	.71	.57	.75	.67	.80
Sexual	AIB_9 Asking a partner to prove their love by having sex	.78	.68	.81	.71	.91
	AIB_15 Refuse to use condoms/ birth control even when a partner wants to	.62	.63	.63	.54	.75

(Table 5. continued)

Table 5. continued

Factor	Item	Global (n = 591) Factor loading	Female (n = 257) Factor loading	Male (n = 324) Factor loading	Hispanic/Latino/ Spanish origin (n = 428) Factor loading	All Other Race/ Ethnicity (n = 154) Factor loading
Stalking	AIB_11 Drive by or show up at a partner's house or work unannounced	.65	.66	.65	.63	.68
	AIB_12 A partner must share their location when asked	.79	.74	.82	.78	.79
Digital	AIB_13 Read a partner's messages and/or go through their phone	.87	.85	.90	.88	.84
	AIB_14 Require a partner to share passwords	.85	.87	.84	.87	.80
	χ^2	96.86	78.12	66.21	69.92	70.20
	df	34	34	34	34	34
	p value	<.001	<.001	.001	<.001	<.001
	CFI	.97	.94	.97	.97	.94
	RMSEA	.06	.07	.05	.05	.08
AIB Measurement Model		Global (n = 591)	Female (n = 257)	Male (n = 324)	Hispanic/Latino/ Spanish origin (n = 428)	All Other Race/ Ethnicity (n = 154)

(*Table 5. continued*)

Table 5. continued

AIB Measurement Model		Global (n = 591) Factor loading	Female (n = 257) Factor loading	Male (n = 324) Factor loading	Hispanic/Latino/ Spanish origin (n = 428) Factor loading	All Other Race/ Ethnicity (n = 154) Factor loading
Factor	Item					
Physical	AIB_1 Grab, shove, punch or kick someone to hurt them, not to be playful	.59	.52	.62	.54	.65
	AIB_8 Hurt someone who is flirting with your boyfriend/ girlfriend	.61	.56	.62	.65	.54
Emotional	AIB_5 Repeatedly ask to get together with someone who has already said no	.64	.64	.65	.62	.69
	AIB_6 Publicly rate or label someone else's attractiveness	.69	.60	.71	.67	.71
	AIB_7 Making jokes about someone's sexuality	.71	.57	.75	.67	.80
Sexual	AIB_9 Asking a partner to prove their love by having sex	.78	.68	.81	.71	.91

(*Table 5. continued*)

Table 5. continued

Factor	Item	Global (n = 591) Factor loading	Female (n = 257) Factor loading	Male (n = 324) Factor loading	Hispanic/Latino/ Spanish origin (n = 428) Factor loading	All Other Race/ Ethnicity (n = 154) Factor loading
	AIB_15 Refuse to use condoms/ birth control even when a partner wants to	.62	.63	.63	.54	.75
Stalking	AIB_11 Drive by or show up at a partner's house or work unannounced	.65	.66	.65	.63	.68
	AIB_12 A partner must share their location when asked	.79	.74	.82	.78	.79
Digital	AIB_13 Read a partner's messages and/or go through their phone	.87	.85	.90	.88	.84
	AIB_14 Require a partner to share passwords	.85	.87	.84	.87	.80
	χ^2	96.86	78.12	66.21	69.92	70.20
	df	34	34	34	34	34
	p value	<.001	<.001	.001	<.001	<.001
	CFI	.97	.94	.97	.97	.94
	RMSEA	.06	.07	.05	.05	.08

Table 6. Comparison of APB Measurement Model "My Peers Believe It Would Be Okay To" by Gender and Race/Ethnicity.

		Global (n = 591)	Female (n = 257)	Male (n = 324)	Hispanic/Latino/Spanish origin (n = 428)	All Other Race/Ethnicity (n = 154)
APB Measurement Model						
Factor	Item	Factor loading	Factor loading	Factor loading	Factor loading	Factor loading
Physical	APB_1 Grab, shove, punch or kick someone to hurt them, not to be playful	.76	.74	.77	.76	.76
	APB_8 Hurt someone who is flirting with your boyfriend/girlfriend	.77	.76	.78	.75	.81
Emotional	APB_5 Repeatedly ask to get together with someone who has already said no	.82	.81	.83	.82	.84
	APB_6 Publicly rate or label someone else's attractiveness	.86	.87	.85	.88	.85
	APB_7 Making jokes about someone's sexuality	.89	.88	.88	.91	.83
Sexual	APB_9 Asking a partner to prove their love by having sex	.90	.92	.89	.89	.86
	APB_15 Refuse to use condoms/birth control even when a partner wants to	.70	.61	.77	.67	.83

(Table 6. continued)

Table 6. continued

Factor	Item	Global (n = 591) Factor loading	Female (n = 257) Factor loading	Male (n = 324) Factor loading	Hispanic/Latino/Spanish origin (n = 428) Factor loading	All Other Race/Ethnicity (n = 154) Factor loading
Stalking	APB_11 Drive by or show up at a partner's house or work unannounced	.78	.80	.77	.78	.73
	APB_12 A partner must share their location when asked	.90	.87	.91	.92	.86
Digital	APB_13 Read a partner's messages and/or go through their phone	.95	.97	.93	.95	.96
	APB_14 Require a partner to share passwords	.91	.93	.89	.90	.93
	χ^2	116.12	79.97	67.64	73.22	82.94
	df	34	34	34	34	34
	p value	<.001	<.001	.001	<.001	<.001
	CFI	.98	.97	.98	.99	.95
	RMSEA	.06	.07	.06	.05	.10

only has a small effect size with $d = 0.14$, although it is statistically significant as well. Table 5 presented the factor means and standard deviations for AIB and APB using the identical five-factor CFA models identified in this current study (AIB & APB Model 3; Figure 6).

Discussion

This study investigated the following four research questions: What are the measured constructs in this survey? Is the hypothesized factor structure of the five types of relationship abuse (physical, emotional, sexual, stalking, and digital) confirmed? Does the validity of constructs vary among racial/ethnic groups and genders? Are there differences between teens' own beliefs on the appropriateness of relationship abuse and their perceptions of peers' beliefs? To answer these questions, the pre-collected data from teens in two high schools were analyzed to examine the internal structural validity and construct validity of an original and unpublished survey on this topic. The survey was originally developed by the Conflict Center, but the measure's structure and constructs had not been confirmed nor validated for the five types of relationship abuse as intended. This study explored the psychometric properties of the survey with EFA and CFA models, established the measurement invariance among gender and racial/ethnic groups, and compared teens' personal beliefs versus their perceptions of peers' beliefs to investigate the

Table 7. Paired Samples t Tests: Comparison of AIB and APB Means on the Five Factors.

Factor		*M*	*SD*	*t*	*df*	*p*	*d*
Physical	AIB	3.24	0.73	8.764	513	< .001	.39
	APB	2.92	0.92				
Emotional	AIB	3.48	0.60	12.815	513	< .001	.67
	APB	2.96	0.92				
Sexual	AIB	3.40	0.71	9.725	483	< .001	.45
	APB	3.04	0.87				
Stalking	AIB	2.72	0.82	3.026	482	.003	.14
	APB	2.60	0.93				
Digital	AIB	2.76	0.89	6.645	482	< .001	.30
	APB	2.47	1.03				

Note. d = 0.2 indicates a small effect size, 0.5 indicates a medium effect size, 0.8 indicates a large effect size (Cohen, 1988).

differences and potential misperceptions or misunderstandings among teens and their peers regarding relationship abuse.

Teens' Beliefs on Five Factors of Relationship Abuse

The CFA results indicate that the 5-factor 11-item model for both AIB and APB (Model 3) is a reliable and valid way to measure teens' beliefs and their perceptions of their peers' beliefs on five types of relationship abuse, which confirmed the authors' hypothesized model grouped by the five abuse factors. More specifically, teens identified the five factors proposed by the Conflict Center, including physical, emotional, sexual, stalking, and digital abuses, which have been identified as the most common types of teen relationship abuse by many previous studies (e.g., Murray, 2019; Niolon et al., 2015; Taylor & Mumford, 2016).

The final 5-factor model has 11 identical items for AIB and APB scales that best measure each factor. Each item represents a single concept for a specific factor of relationship abuse, which avoids the issues of unclear, crossed or redundant concepts for an item or construct. More specifically, there were four items related to the Physical factor in the initial hypothesized model: (a) "Grab, shove, punch or kick someone to hurt them, not to be playful" (Item 1), (b) "Threaten to hurt someone else" (Item 2), (c) "Make unwanted physical sexual advances (grabbing, touching, kissing) toward someone else" (Item 3), and (d) "Hurt someone who is flirting with your boyfriend/girlfriend" (Item 8). All these four items have some similarities and associations with physical abuse in different ways. However, if we rethink about the differences among these four items, we can see that both Item 1 and 8 describe the actual physical abusive behaviors using words such as "punch" "kick" or "hurt", while Item 2 only describes a potential physical violence that not actually happened using the word of "threaten," and Item 3 has the problem of crossed concepts in both physical and sexual abuses. Also, Item 2 and 3 did not consistently show good fit to the Physical factor in AIB and APB models, so these two items were removed. Similarly, Item 4 "Make unwanted sexual comments/gestures toward someone else" was removed from the measure due to the issue of crossed concepts in both emotional and sexual abuses.

The items for Stalking and Digital factors are all good fits and clear concepts to each factor, therefore, all the four items of these two factors are kept for the measure. Stalking by intimate partners is often not considered concerning or less seriousness in IPV(Scott et al., 2010). A more recent study of Woodlock (2017) found that technology-facilitated stalking was emerging, which is a combination of stalking and digital abuse. The perpetrators used phones, tablets, computers, and social networking websites to stalk, isolate,

punish, humiliate, or threaten to share sexualized content online to domestic violence victims (Woodlock, 2017). Using the validated TBRAM instrument's stalking and digital constructs, future research can investigate the relationship between these two types of abuse among teens.

Teens' Misperceptions of Peers

The results indicate that there are significantly differences between teens' own beliefs and their perceptions of peers' beliefs regarding the appropriateness of five types of relationship abuse (Physical, Emotional, Sexual, Stalking, and Digital). This also confirmed the hypothesis based on previous studies that many students believe positive and healthy behaviors should be appropriate for a romantic relationship, but they believe their peers engage in negative, unhealthy or abusive relationship behaviors ([author organization name], 2019; Keller & Bauerle, 2009; Lucero et al., 2014; National Social Norms Center, 2020).

Crockett et al. (2006) suggested that risky sexual behavior was significantly and positively associated with *negative peer pressure* or peer's encouragement of risk taking, meaning teens who had received more negative peer pressure were more likely to have experience of risky sexual behavior. Selikow et al.'s (2009) qualitative study also found that negative peer pressure could increase high risk sexual behavior among teens. Thus, they suggested that it was important to understand and decrease negative peer pressure in order to change harmful social norms to healthy norms (Selikow et al., 2009). Comparing the overall means of each factor between "I believe" (AIB) versus "my peers believe" (APB) scales, teens' self-belief scores are significantly higher than the scores of how they think their peers' beliefs for all five factors. The Emotional factor like "Make jokes about someone's sexuality" (Item 7) has the largest effect size regarding the difference between self-belief and peer-belief among the five factors, which indicates that teens have a highly positive belief regarding emotional abuse, but they tend to perceive their peers to have a very negative belief on this factor. All the other four factors showed significantly differences of small to medium effect size between self-belief and peers-belief scores for the teens. The large gaps between "I believe" and "my peers believe" scores for all five factors also reflect that although the most teens have highly positive beliefs on relationship behaviors, they tend to think their peers are more negatively believing or behaving in relationships, which can be seen as a misperception or misunderstanding among teens and their peers.

Comparing the means of the five identified factors of relationship abuse for teens' self-beliefs (AIB), they had the most positive beliefs on Emotional

abuse, indicating that the emotional abuse is the most unacceptable abuse for teens, which is a similar finding like many previous research (e.g., Niolon et al., 2015; Taylor & Mumford, 2016). The Sexual, Physical, Digital abuses are followed, while the Stalking abuse like "Drive by or show up at a partner's house or work unannounced" (Item 11) seemed the least positive among these five factors for teen themselves, indicating that stalking abuse tends to be neutral or in a "gray area" to teens. When comparing the overall means of the five factors for teens' perceptions of their peers' beliefs (APB), the Sexual abuse rated the most positive and followed by Emotional, Physical, and Stalking abuses. The Digital abuse like "Read a partner's messages and/or go through their phone" (Item 13) was rated the lowest on average, which indicates that teens tend to negatively perceive their peers' beliefs toward digital abuse. They believe the digital abuse could be the somewhat acceptable or neutral for their peers. In general, the Emotional, Sexual, and Physical abuses are rated higher for both self-belief and peers-belief scales (indicating more positive beliefs), while the Digital and Stalking abuses are rated lower for both scales (indicating more negative beliefs).

Implications for Using the Teen Beliefs on Relationship Abuse Measure (TBRAM)

There are three major strengths and significance of the validated instrument of TBRAM (Appendix A). First, the measure is developed from an original and innovative survey created by a non-profit organization, which was not used or published in any previous academic research. These items have been vetted and used successfully in practice on a sample of participants represented diverse age, gender, racial/ethnic identity, and sexual orientation.

Second, with only 11 items for each scale of AIB and APB (22 items in total), TBRAM will be a quick and valid tool for other researchers, educators, and parents to measure and understand teen perceptions of different types of relationship abuses to better support them develop healthy, respectful, and nonviolent relationships. TBRAM will be a useful tool to understand if a participant's beliefs on specific factors of relationship abuse is more positive or negative. Instead of a general concept/construct of beliefs on relationship abuse, this instrument can measure a specific factor among the five in one survey. Specifically, the measure can help educators and parents identify which type of abuse may be more concerning for a teen so that they can offer more accurate advice and help on that type of abuse. The measure could be used to inform appropriate practices and decisions in educating and counseling young people to reduce the level of violence or abuse in schools.

Third, TBRAM measures both teen's perceptions of their own belief and their peers' belief regarding five types of relationship abuse. It will be useful to compare participants' perceptions of their own beliefs versus how they perceive peers' beliefs to assess if there is a gap or misperception among a group of teens in order to guide them to understand their peers may have the similar positive beliefs too, and also understand that unhealthy and violent behaviors in relationships are not the correct way to gain acceptance by their peers, which is known as *positive peer pressure* (The Conflict Center, 2019).

Limitations

The limitations in the development and validation of the TBRAM were mainly due to the demographics of the sample. The sample of this study was predominantly of Hispanic, Latino, or Spanish descent. This makes it difficult to generalize the findings of this study to other populations. However, this study was not aimed to generalize results, but to examine the content validity of an original survey instrument, and the sample was specific for CFA. The results can be useful for other urban public schools with similar structure and student body.

Second, the participants were not given a list of definitions for each term used in the survey instrument, like many survey-based studies, this study also had potential limitations due to self-reported responses and different definitions/understandings by each participant.

Last, although the response rate was lower than expected due to the date for data collection was a testing day, the sample size was much larger than a commonly accepted size for the intended statistical analysis methods for this study.

Recommendations for Future Research

This is a pilot study of validating this original measure, and more studies and validations on this measure are needed. First, future research can expand the sample size to include and represent a more diverse population of teen from various backgrounds, and validate the measure of TBRAM. Second, measurement studies can also consider adding other factors such as verbal abuse, threatening abuse or financial abuse to expand the measured constructs of relationship abuse types. Last, future research on the content aspects of teen relationship abuse can explore why teens tend to have more negative perceptions of their peers regarding relationship abuse and why emotional or sexual relationship abuses tend to be more unacceptable to teens and why digital or stalking relationship abuses tend to be less rejective to them.

Declaration of Conflicting Interests

Funding

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Appendix A: Final Version Measure

Teen Beliefs on Relationship Abuse Measure (TBRAM)

This survey has 11 items to measure teen perceptions on their own belief and how they perceive their peers' belief regarding five types of relationship abuse (physical, emotional, sexual, stalking, and digital). This scale uses a four-point scale: 1 = Ok, 2 = A little bit ok, 3 = Not ok, and 4 = Never ok with higher responses indicating more positive beliefs regarding relationship behaviors. The participants should respond to the 11 items from their own perspectives and their perceptions about their peers:

- Self-belief: *Based on your experience, indicate how appropriate you believe it would be okay to-*
- Peer belief: *Based on your experience, indicate how appropriate your peers at school believe it would be okay to-*

Physical:
Grab, shove, punch or kick someone to hurt them, not to be playful. (Item 1)
Hurt someone who is flirting with your boyfriend/girlfriend (Item 8)

Emotional:
Repeatedly ask to get together with someone who has already said no. (Item 5)
Publicly rate or label someone else's attractiveness. (Item 6)
Making jokes about someone's sexuality (such as "that girl is a slut" or "that guy is a fag") (Item 7)

Sexual:
Asking a partner to prove their love by having sex. (Item 9)
Refuse to use condoms/birth control even when a partner wants to. (Item 15)

Stalking:
Drive by or show up at a partner's house or work unannounced. (Item 11)
A partner must share their location when asked. (Item 12)

Digital:
Read a partner's messages and/or go through their phone. (Item 13)
Require a partner to share passwords. (Item 14)

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