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Measuring adolescent drinking-refusal self-efficacy: Development and validation of the Drinking Refusal Self-Efficacy Questionnaire-Shortened Adolescent version (DRSEQ-SRA)

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Abstract

Background This study aimed to develop and validate a shortened version of the Drinking Refusal Self-Efficacy Questionnaire – Revised Adolescent version (DRSEQ-RA) using a large sample of adolescents. **Methods** Secondary school students (N = 2,609, M = 14.52 years, SD = 0.94) completed the DRSEQ-RA (consisting of subscales: Social Pressure; Opportunistic; Emotional Relief) and the Alcohol Use Disorders Identification Test (AUDIT). These data were analysed using non-parametric item response theory (NIRT) including Mokken scalability coefficients, and confirmatory factor analysis. **Results** Social Pressure subscale items were better able to distinguish between adolescents with lower or higher levels of drinking refusal self-efficacy, while the Opportunistic and Emotional Relief subscale items were able to distinguish adolescents with low drinking-refusal self-efficacy. The DRSEQ-RA was reduced from 19-items to a 9-item scale and retained the original three-factor structure. The reduced scale was named the Drinking Refusal Self-Efficacy Questionnaire – Shortened Revised Adolescent version (DRSEQ-SRA). The DRSEQ-RA and the DRSEQ-SRA have almost identical psychometric properties. They both demonstrated good fit to the data, each explained 18% of the variance in alcohol consumption, *Adj.* R^2 = 0.18, $p < .001$ respectively. The DRSEQ-RA and the DRSEQ-SRA also have excellent scale and subscale internal reliability (αs = .92 - .99). **Conclusions** The DRSEQ-SRA is a short, 9-item, measure of adolescent drinking-refusal self-efficacy which demonstrates both reliability and validity. A significant advantage is brevity. The DRSEQ-SRA may be a valuable tool for identifying risk of adolescent drinking and prevention/treatment planning in settings where survey administration time is critical.

Keywords: Self-efficacy, adolescent, validation, scale, alcohol, psychometrics

1. Introduction

Adolescent alcohol misuse is a public health problem, contributing to a large proportion of youth morbidity and mortality (Australian Institute of Health and Welfare, 2011; World Health Organization, 2014). Early adolescent drinking is associated with later problem drinking (Connor, Haber, & Hall, 2016; Odgers et al., 2008; Warner & White, 2003), use and abuse of other substances, criminal activity, and increased academic problems including dropping out of school (Ellickson, Tucker, & Klein, 2003), conduct problems (Rossow & Kuntsche, 2013), and early (unplanned) parenthood (Odgers et al., 2008).

Prevention and early intervention is recommended as key to reducing the risk of detrimental outcomes from alcohol use (Stockings et al., 2016). In order to design and implement effective interventions, the mechanisms that underpin drinking behaviour need to be understood. One such mechanism of action in adolescents is drinking-refusal self-efficacy, which is the confidence in one's ability to resist drinking alcohol in different contexts. Self-efficacy is one of the most consistent predictors of alcohol dependence treatment outcomes and may contribute to onset and maintenance of alcohol use through direct or vicarious paired associations between alcohol use and outcomes (Adamson, Sellman, & Frampton, 2009; Connor et al., 2016; Kadden & Litt, 2011; Young, Connor, & Feeney, 2011). Drinking refusal self-efficacy has been shown to mediate the association of other established risk factors with harmful alcohol use such as impulsivity and positive alcohol expectancy in both adolescent and adult populations (Connor, George, Gullo, Kelly, & Young, 2011; Gullo, Dawe, Kambouropoulos, Staiger, & Jackson, 2010; Harnett, Lynch, Gullo, Dawe, & Loxton, 2013).

Adolescents and adults demonstrate differing patterns of perceived self-efficacy; compared to adult alcohol use, adolescent alcohol use is more likely to be driven by social contexts and expectations of social pressure and social outcomes (Aas, Klepp, Laberg, &

Aarø, 1995; Jester et al., 2015; Jones, Will, & Fromme, 2001; Tomlinson & Brown, 2012; Young-Wolff et al., 2015). An adolescent-specific, reliable and valid drinking refusal self-efficacy measure would assist in both establishing prevalence to inform prevention program design, in addition to evaluating alcohol harm reduction interventions targeting adolescents.

As far as the authors are aware, the adolescent version of the Drinking Refusal Self-Efficacy Questionnaire-Revised (DRSEQ-R) is the only adolescent-specific measure of drinking-refusal self-efficacy. The DRSEQ-R is a self-rated scale that measures the perceived ability to resist drinking (Oei, Hasking, & Young, 2005). The DRSEQ-R has been comprehensively validated in community (Oei et al., 2005), university (Young, Connor, Ricciardelli, & Saunders, 2006) and alcohol dependent populations (Young et al., 2011) with similar measures developed for other substance misuse refusal self-efficacy for example cannabis (Young, Gullo, Feeney, & Connor, 2012). The adolescent version of the measure (DRSEQ-RA), has good-to-excellent reliability and promising validity, as scores on the DRSEQ-RA were shown to be negatively related to alcohol consumption (Connor et al., 2011; Young, Hasking, Oei, & Loveday, 2007). The DRSEQ-RA and the DRSEQ-R comprise three factors; Social Pressure (e.g., perceived ability to desist drinking "When I am at a party"), Emotional Relief (e.g., perceived ability to resist drinking to regulate mood "When I feel frustrated"), and Opportunistic (e.g., perceived ability to resist drinking when the opportunity arises "When I first arrive home") (Oei et al., 2005; Young et al., 2007). These three factors load onto a single higher-order refusal self-efficacy factor (Connor et al., 2011; Young et al., 2007).

Drinking refusal self-efficacy is a strong predictor of adolescent alcohol use and has been the focus of large-scale prevention and intervention efforts (Cuijpers, 2002). The importance of drinking refusal self-efficacy in clinical interventions, prevention programs and research indicate that a psychometrically valid and robust measure would prove valuable.

A shortened scale capturing comparable information to full-length scales (Fromme & D'Amico, 2000) that is reliable and valid would be of benefit to early intervention efforts and prevention program settings where time, user fatigue and cognitive capacity as well as other resources can be limited.

The current study has two aims: 1) Build on previous psychometric evidence for the DRSEQ-RA by examining the reliability and predictive validity of the measure in a large independent adolescent sample, as well as to confirm the factor structure of the DRSEQ-RA; 2) propose and psychometrically evaluate a shorter version of the DRSEQ-RA, with the purpose of facilitating more efficient data collection for future research involving this construct.

2. Method

2.1. Participants

Pre-intervention baseline data from the Game On: Know Alcohol (GOKA) project see (Rundle-Thiele et al., 2013, 2015) were utilised. Participants were 2,747 Australian Grade 10 students from 24 Queensland schools. Five percent or less of the data were missing on all variables. As Little's Missing Completely at Random (MCAR; (Little, 1988) was non-significant, $\chi^2(165, N = 2{,}747) = 163.41$, $p = .520$, missing cases (N = 138; 5%) were excluded from analyses. The average age of the remaining students was 14.52 years, SD = 0.94, N = 2,609, males = 1,298 (49.8%), gender missing = 77 (3%).

2.2. Measures

2.2.1. Drinking Refusal Self-Efficacy Questionnaire – Revised Adolescent version (DRSEQ-RA). The DRSEQ-RA is an adolescent-appropriate adaptation of the adult DRSEQ-R, both of which comprise 19-items assessing three areas of belief in one's ability to refuse alcohol: when there is social pressure, when the opportunity arises, or for emotional relief

(Oei et al., 2005; Young et al., 2007). The DRSEQ-RA utilises a 6-point Likert scale (1 = "I am very sure I could NOT resist drinking; 6 = "I am very sure I could resist drinking").

2.2.2. Drinking status and alcohol use. The Alcohol Use Disorders Identification Test (AUDIT) is a 10-item scale developed by the World Health Organization (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) and has been used as a valid tool to assess adolescent alcohol problems (Toumbourou et al, 2014). The AUDIT includes three consumption items in addition to seven items assessing dependence and alcohol-related problems. Item 1-8 are assessed using a 5-point Likert type response style (e.g., 0 = Never; 4 = Daily or almost daily) and items 9 and 10 utilise a 3-point Likert scale (0 = 'No'; 4 = 'Yes, during the last year'). The first three items comprise the AUDIT-C, which assesses frequency of typical and binge use and typical quantity of use (Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998). Both the AUDIT and the AUDIT-C were analysed in the present study. Cronbach's α for the AUDIT and AUDIT-C was 0.89 and 0.86, respectively. Participants were also categorised into those who did and did not drink based on their response to whether they had ever consumed a full alcoholic beverage.

2.3. Statistical method

2.3.1 Item Response Theory (IRT)

Item Response Theory (IRT) infers individuals' scores on psychological latent traits through modelling person parameters, item parameters and item responses (Embretson & Diehl, 2000). IRT differs from classical test theory which infers trait (true) scores by measuring observed scores and accounting for error. The inclusion of item parameters makes this method advantageous for scale reduction, as items can be individually evaluated for their ability to discriminate differing trait levels of the construct. Nonparametric Item Response Theory (NIRT) was employed in this study as it gives greater allowance for non-monotonic and non-logistic functions, which are assumptions of parametric IRT (Khan, Lewis, &

Lindenmayer, 2011; Meijer & Baneke, 2004; Peters, Sunderland, Andrews, Rapee, & Mattick, 2012).

Mokken's (1971) model of monotone homogeneity (MMH) was used in the current study to investigate scale and item strength. Originally calculated to estimate the extent to which pairs of items or the scale approximates an ideal Guttman scalogram, Mokken's scalabilities coefficient (*H)* is meaningful in that it gives an indication of item commonalities and therefore whether they can be explained by the same underlying trait (Sijtsma & Molenaar, 2002). The scalability coefficients are calculated using covariances between individuals' scores on items. For more information see Meijer and Baneke (2004), Sijtsma and Molenaar (2002) and van der Ark (2012). H_i is the scalability coefficient for item *i* and is the normalised covariance for that item. If the item is related to other items in the scale H_i will be positive (i.e., we can infer the items measure similar construct and therefore belong to the same scale). *H* is the scalability coefficient (normalised covariance) for the total scale. Guidelines for interpretation suggest that scales can be classified as weak ($0.3 \leq H < 0.4$), medium ($0.4 \leq H < 0.5$), or strong ($0.5 \geq H$) (Mokken, 1971).

Option Characteristic Curves (OCCs) and Item Characteristic Curves (ICCs) were displayed using nonparametric (Gaussian) Kernel Smoothing (Ramsay, 2000). Individuals are assigned a value based on their scale score and are ranked according to these values. The distribution is broken into quantiles according to a standard normal distribution and ranked values are converted into quantile scores. The probability of choosing certain responses at various quantile locations is estimated by assigning individuals a dichotomous value on an indicator variable based on the options they chose for each item and smoothing (local averaging) the relationship between these indicator variables and the standard normal quantiles. See Ramsay (2000) for further reading.

OCCs detail the probability of individuals selecting each option (probability represented on the y-axis) for the item according to their standardized normal latent trait score (x-axis) and overall quantile position. An ideal OCC would show individuals with low DRSE having a greater probability of selecting the lower item options, individuals with average DRSE having a greater probability of selecting the middle item options, and individuals with higher DRSE having a greater probability of selecting higher item options. ICCs map the probability of individuals selecting item options (item options are represented on the y-axis; for DRSEQ-RA the options are 1 – 6) according to their standardized normal latent trait score (x-axis) and overall quantile position. In an ideal ICC the probability of selecting an option should increase with increases in the latent trait score.

2.4. Procedure and analyses

A bimodal distribution was observed. Closer inspection of the data revealed that 58 (3.3%) of the participants who reported on the AUDIT that they had never had a drink containing alcohol scored 19 on the total DRSEQ-RA, indicated that they were "very sure [they] could NOT resist drinking" on all of the items. This was interpreted as a misunderstanding of the scale anchors and these answers were reverse coded. The total data were split into two datasets using the 'Random select' function in SPSS. There were no significant demographic or outcome differences between the two datasets.

Item analysis was conducted on dataset 1 (N = 1,324; M age = 14.58, SD = .83; N females = 614(46%), missing = 37(3%)). OCCs and ICCs for individual items were produced in Testgraf (Ramsay, 2000) and the Mokken R package (van der Ark, 2007, 2012) was used to calculate Mokken scalability coefficients. Using this information, the scale was reduced. Dataset 2 (N = 1,285; M age = 14.57, SD = .79); N females = 620(48%), missing = 40(3%)) was used to examine the psychometric properties of the shortened scale, including regression analyses, reliability calculations, and confirmatory factor analysis.

The CFAs were conducted using the lavaan package (version 18; (Rosseel, 2012) in R (version 3.2.1) using Weighted Least Squares estimation due to data non-normality. Model fit was examined using the χ^2 test and the Akaike Information Criterion (AIC) (Akaike, 1987), comparative fit index (CFI), root mean-square error of approximation (RMSEA), and the standardized root mean-square residual (SRMR). Guidelines to indicate good fit were CFI $\geq$ .95, RMSEA $\leq$ .06, SRMR $\leq$ .08, and smaller AIC values (Akaike, 1987; Marsh, Hau, & Wen, 2004; Tabachnick & Fidell, 2007).

3. Results

3.1. Descriptives

See Table 1 for descriptive statistics for drinking refusal self-efficacy and alcohol use. Overall, drinking refusal self-efficacy was high and alcohol use was low.

>>Insert Table 1 here<<

3.2. Item Analysis (Dataset 1; N = 1,324)

Two CFAs were conducted to assess unidimensionality, which is a core assumption of IRT (Khan et al., 2011; Meijer & Baneke, 2004; Peters et al., 2012). The theorised structure of the DRSEQ-RA (3 factors with a higher order factor) was compared to a single factor model (see Table 2). As the theorised model was a better fit to the data ($\chi^2_{diff}(df_{diff})$ = 182.28(3), $p < .001$), IRT analyses were conducted on subscales rather than the whole scale.

>>Insert Table 2 here<<

Smoothing parameters of 0.62, 0.85, and 0.79 were used for the Social Pressure, Emotional Relief, and Opportunistic analyses respectively due to non-monotonicity. As items in each subscale showed similar OCCs and ICCs, examples are shown in Figures 1 and 2 and all figures are presented in the supplementary materials. The OCCs for the Social Pressure subscale items showed promising results with students in the lowest 5% of DRSE choosing option 1 (very sure could not resist alcohol) with greater probability and students in the

highest 50% or 75% of DRSE more likely to choose option 6 (very sure could resist alcohol). The OCCs for the Opportunistic and Emotional Relief subscale items showed that most students were confident in their ability to resist alcohol related to opportunistic and emotional triggers, as indicated by the tendency of students with lower DRSE choosing option 6 (very confident can resist). The population is relatively alcohol naïve (67.60% report frequency of use as 'never'), therefore this confidence in drinking refusal may be partly explained by the adolescents having few opportunities where their self-efficacy has been tested. However, the choice of option 6 was less likely to be chosen for students in the lower 25% of DRSE ability, and those with very low DRSE were more likely to choose option 1 (very sure could not resist alcohol), showing that these subscale items were distinguishing individuals with low DRSE.

>>Insert Figure 1 here<<

Examination of the ICCs revealed similar findings (see Figure 2 for example and supplementary materials for all graphs). While there was some loss of clarity due to the high smoothing parameters, the ICCs showed that the Social Pressure subscale items show consistent increasing slopes, indicating that the items were able to discriminate across quartiles of DRSE up to the 75th percentile. The ICCs for the Opportunistic and Emotional Relief subscale items indicated these scales had less discrimination power compared to the Social Pressure subscale but could discriminate between individuals with DRSE in the lowest 25th to 50th percentiles. Above the 50th percentile there was evidence of a ceiling effect.

>>Insert Figure 2 here<<

As there were similar graph distributions for all items within the three subscales, the decision was made to reduce the scale based on item conformance. Mokken scalability coefficients indicated that all items and total subscales were strong (range = .685 - .856; see Table 3). Items with the greatest scalability coefficients within each subscale were chosen as

potential items for the reduced scale. These were items 5, 8, and 17 for the Opportunistic subscale, items 13, 16, and 19 for the Emotional Relief subscale, and items 4, 9, and 12 for the Social Pressure subscale (see supplementary materials for full scale).

>>Insert Table 3 here<<

3.2. Psychometric analyses (Dataset 2; N = 1,285)

3.2.1. Confirmatory Factor Analysis.

When the shortened scale was analysed using CFA, analyses feedback indicated the presence of negative error variances. Examination of the CFA on the total scale revealed that item 5 of the Opportunistic subscale ("When I am on my way home from school") had the least item variance (.08). Item 5 was replaced with item 14 ("When I have just finished playing sport"). Item 14 had the next greatest Mokken *H* index score and had greater variance (.14).

The CFA on the new shortened scale (item 5 replaced with item 14), herein called the Drinking Refusal Self-Efficacy Questionnaire – Shortened Revised Adolescent version (DRSEQ-SRA) showed good fit to the data (see Table 4 and Figure 3).

>>Insert Table 4 and Figure 3 here<<

3.2.3. Association with alcohol use.

In order to assess convergent validity, regressions between alcohol consumption, alcohol use and each scale were conducted using Dataset 2 (see Tables 5 and 6). Both the DRSEQ-RA and the DRSEQ-SRA significantly explained 18% and 19% of the variance in total AUDIT-C scores and both significantly explained 18% of the variance in alcohol consumption. The DRSEQ-RA Emotional Relief subscale did not significantly predict AUDIT score but did significantly positively predict AUDIT-C score. Further, the DRSEQ-SRA Emotional Relief subscale was significantly positively related to AUDIT and AUDIT-C score use. These positive associations are the opposite direction of expected effects (higher

self-efficacy predicting higher consumption/alcohol use). However, when the DRSEQ-RA and DRSEQ-SRA Emotional Relief subscales were each regressed on the AUDIT and AUDIT-C without including the other subscales in the model, the relationships were in the expected direction; that is, significant and negative. This provides evidence that the positive relationships may be due to suppression effects.

In order to assess gender effects, regressions were also run for males and females separately. The DRSEQ-SRA explained 18% of variance in the AUDIT-C for males, $_{adj}R^2$ = .18, $F(3, 621) = 46.62$, $p < .001$, and 18% for females, $_{adj}R^2$ = .18, $F(3, 616) = 46.35$, $p <$ .001. The DRSEQ-SRA explained 19% of variance in the total AUDIT for males, $_{adj}R^2$ = .19, $F(3, 621) = 50.02$, $p < .001$, and 17% for females, $_{adj}R^2$ = .17, $F(3, 616) = 44.53$, $p < .001$. The emotional relief subscale did not significantly predict AUDIT consumption for females, $B = -.02$, $t(616) = .64$, $p = .522$, but was a significant predictor when analysed regressed on the AUDIT-C alone, $B = -.29$, $t(618) = -7.38$, $p < .001$. Some evidence of non-invariance between sexes was detected, but this could not be formally evaluated due to convergence issues in multi-group models.

>>Insert Tables 5 and 6 here<<

3.2.4. Reliability.

Reliability analyses were conducted using Cronbach's alpha. Reliability for both scales and each subscale was excellent (see Table 7). Cronbach's alpha ranged from .95 - .98 for the DRSEQ-RA and from .93 - .96 for the DRSEQ-SRA.

>>Insert Table 7 here<<

4. Discussion

The aims of this study were to create a shortened version of the adolescent drinking refusal self-efficacy scale, the DRSEQ-RA and to solidify the psychometric properties of the original scale. This scale is the only adolescent measure of drinking-refusal self-efficacy, as

far as the authors are aware. Using a large sample (N = 2,609) of adolescents, we utilised NIRT and factor analyses to evaluate the 19-item DRSEQ-RA and developed a 9-item version of the scale, the DRSEQ-SRA. The psychometric properties of the scales were then assessed. Both scales demonstrated strong psychometric properties.

The DRSEQ-RA and the DRSEQ-SRA each accounted for 18% of variance in alcohol consumption and 18% and 19% of variance in total alcohol use respectively. Therefore, both scales demonstrate good convergent validity and may be useful in identifying adolescents at risk of early alcohol use. The DRSEQ-SRA explained a similar amount of variance as the DRSEQ-RA, indicating that the shortened scale has a similar level of predictive power as the full-length scale. Both scales also demonstrated excellent total scale and subscale reliability, as measured by Cronbach's alpha, and good fit to the data within CFAs. Taken together, the results indicate that the DRSEQ-SRA is a robust and clinically valid measure of adolescent drinking refusal self-efficacy, and is comparable to the 211% longer DRSEQ-RA.

The drinking refusal self-efficacy of participants was high, especially within the Opportunistic and Emotional Relief subscales. However, the scales were able to distinguish those participants with very low drinking-refusal self-efficacy, indicating that it could be useful for screening purposes. Additionally, there was a range of self-rated drinking refusal self-efficacy ability within the Social Pressure subscale, resulting in greater levels of distinction between higher levels of drinking refusal self-efficacy. This is consistent with existing literature suggesting that early alcohol consumption is greatly influenced by social contexts and expectations (Aas et al., 1995; Jones et al., 2001). However, the Emotional Relief and Opportunistic subscales warrant inclusion, as these scales may provide clinical utility and predictive power in at-risk populations. Possible gender invariance was also observed, however, overall the results indicate that the DRSEQ-SRA is appropriate for male and female adolescents. However, it is recommended that further invariance testing is pursed

in a future study with an older adolescent sample which may prevent similar statistical artifacts. It may also be interesting to expand on this line of research by mapping the differing progressions of male and female adolescent drinking refusal self-efficacy. To understand how the DRSEQ-RA and the DRSEQ-SRA would perform with adolescents with lower drinking refusal self-efficacy, further testing should be performed with different populations, e.g., older adolescents and adolescents with existing alcohol use problems.

The high smoothing parameters required for the NIRT curves limited interpretation of the OCCs and the ICCs. However, the graphs are able to provide useful information about levels of discrimination across drinking refusal self-efficacy and were interpreted in combination with the Mokken scalability coefficients. While Mokken analyses assume monotonicity, this assumption was assessed for each item and only one non-significant violation was found. Therefore, it is unlikely that the Mokken results were affected.

5. Conclusions

In conclusion, a 9-item version of the DRSEQ-RA was developed using a large sample of adolescents. The shortened scale, the DRSEQ-SRA, retained the high psychometric properties of the full-length scale. Both scales explained a large proportion of the variance in adolescent alcohol consumption and use (18%-19%). Given that drinking refusal self-efficacy is a strong predictor of concurrent and future adolescent alcohol use, an efficient measure of this construct could be ideal for screening, clinical use, prevention program settings as well as research settings, where brevity of assessment is desirable.

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Contributors: S Rundle-Thiele, T Dietrich and JP Connor designed and ran data collection. MJ Gullo, JP Connor, and KA Patton designed the present study and analyses. R Young designed the original scale and gave input to the shortened scale. KA Patton drafted the manuscript. All authors revised and reviewed the manuscript. All authors approved of the final manuscript before submission.

Conflict of Interest: No conflict declared

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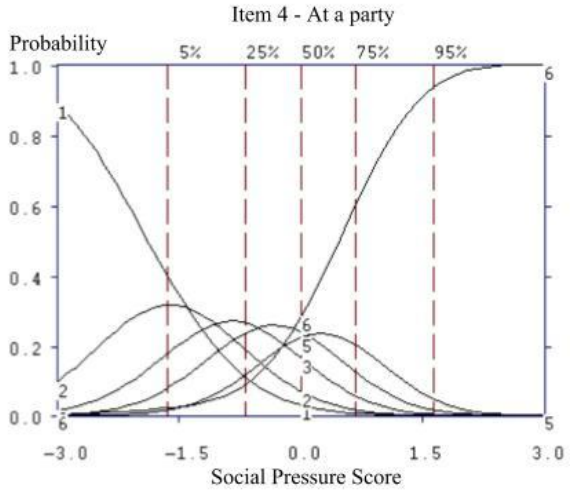
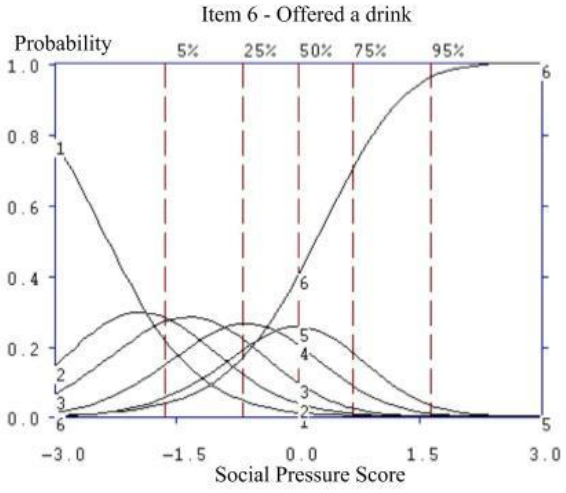
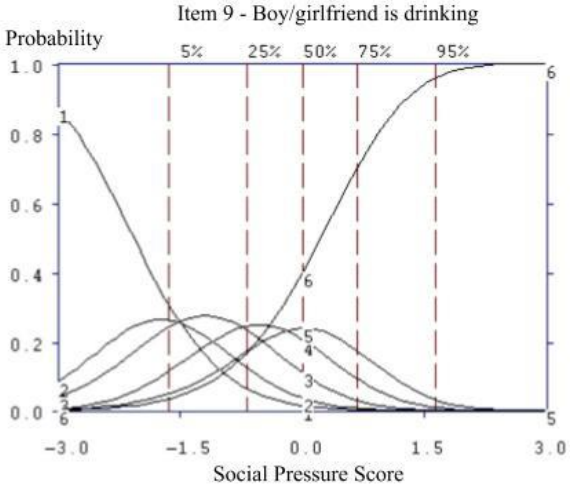
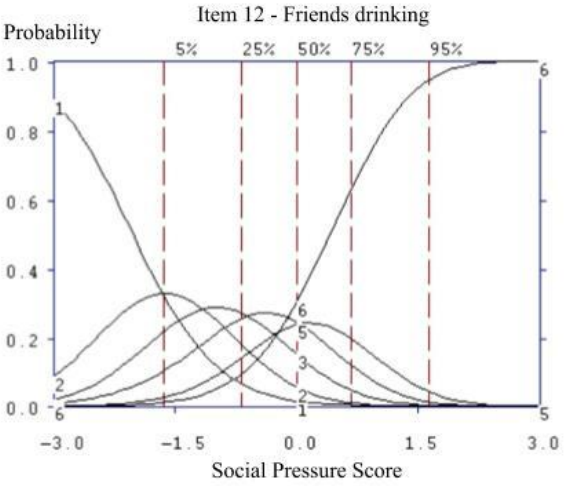
Supplementary materials

Figure S01. OCCs for the Social Pressure subscale.









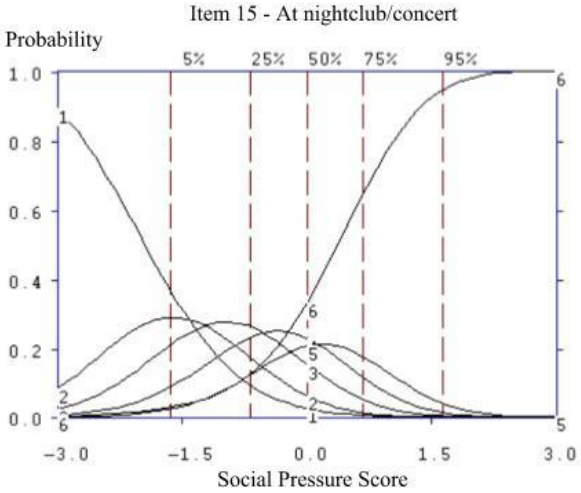


Figure S02. OCCs for the Opportunistic subscale.

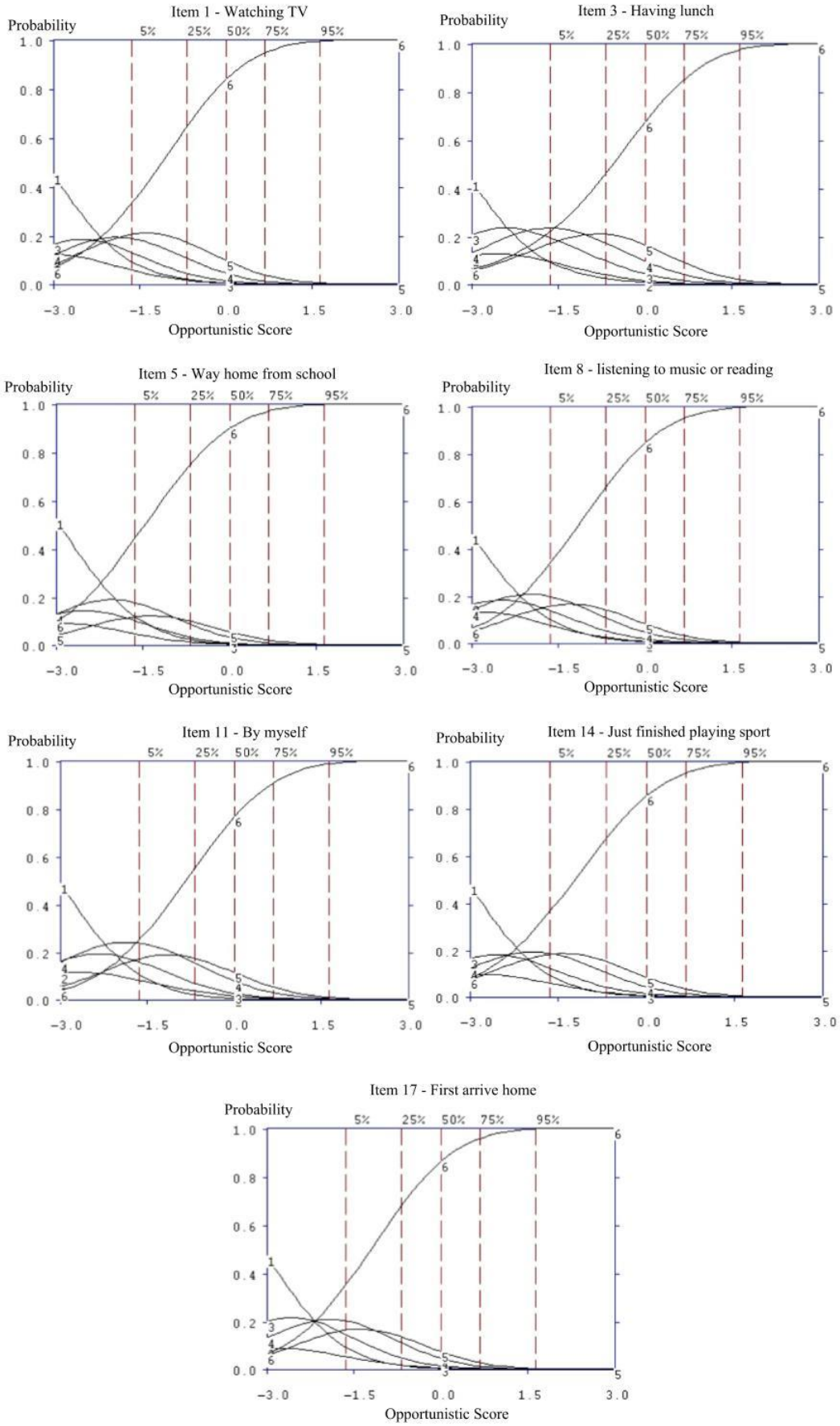


Figure S03. OCCs for the Emotional Relief subscale.

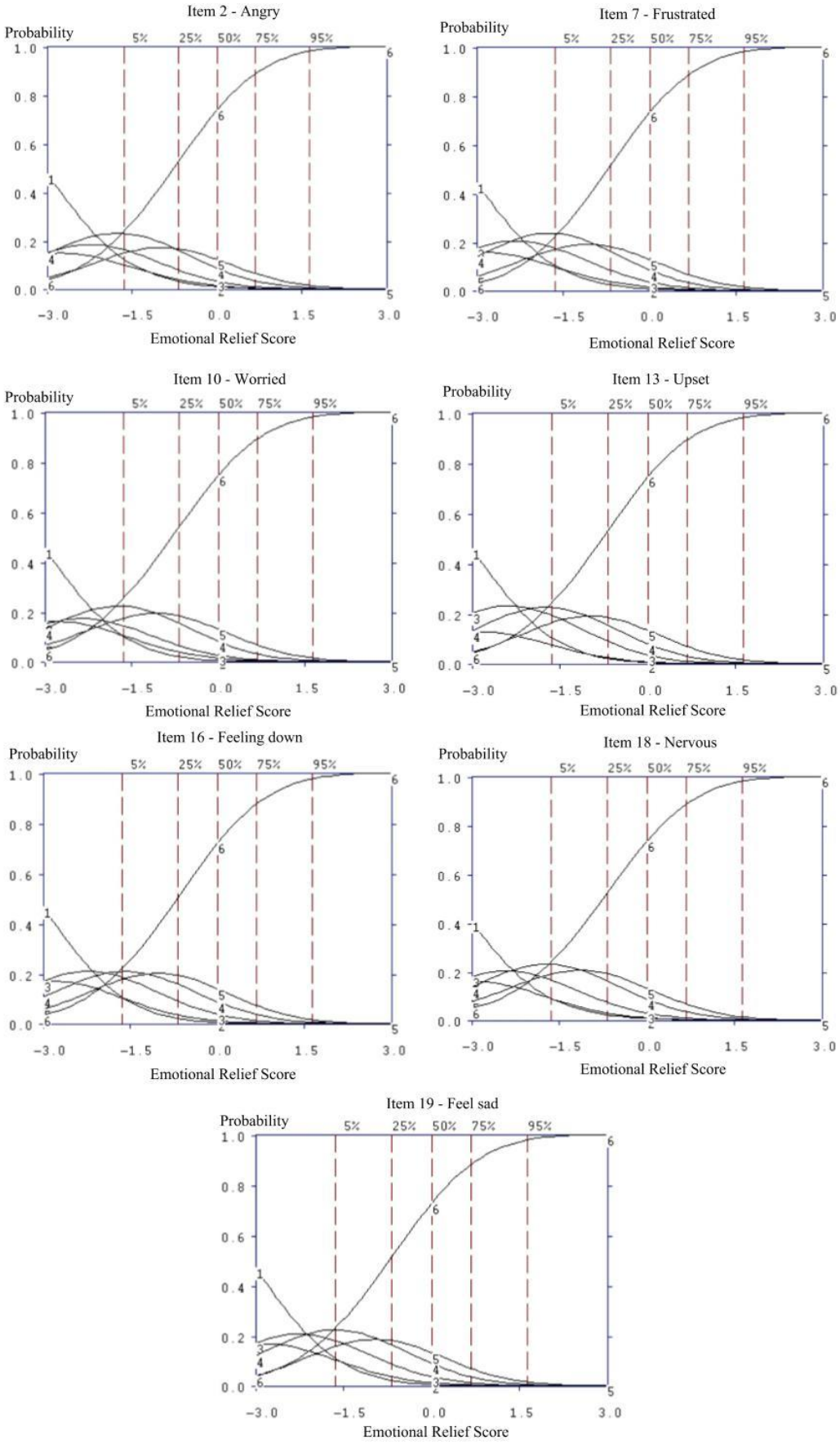


Figure S04. ICCs for the Social Pressure subscale.

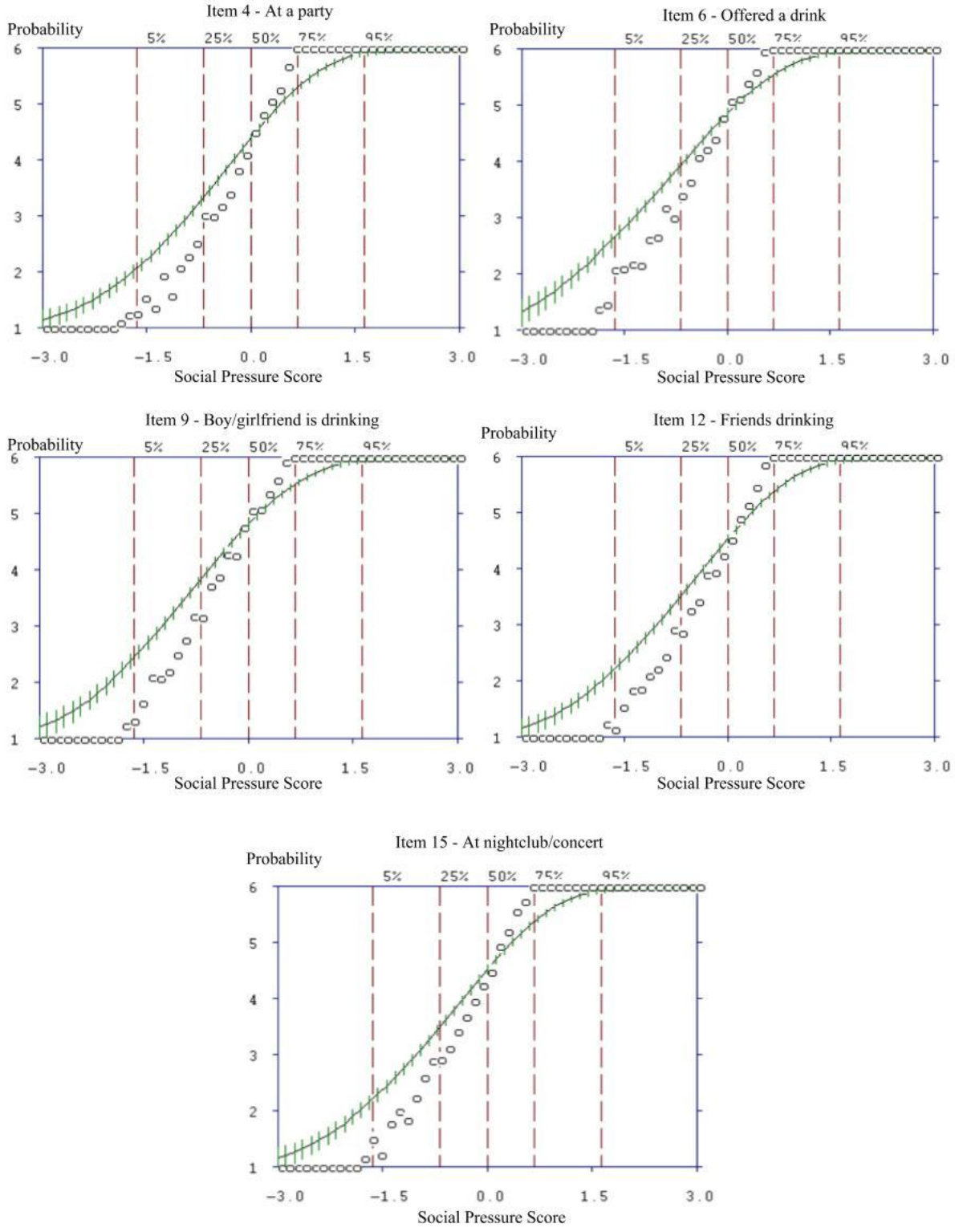


Figure S05. ICCs for the Opportunistic subscale.

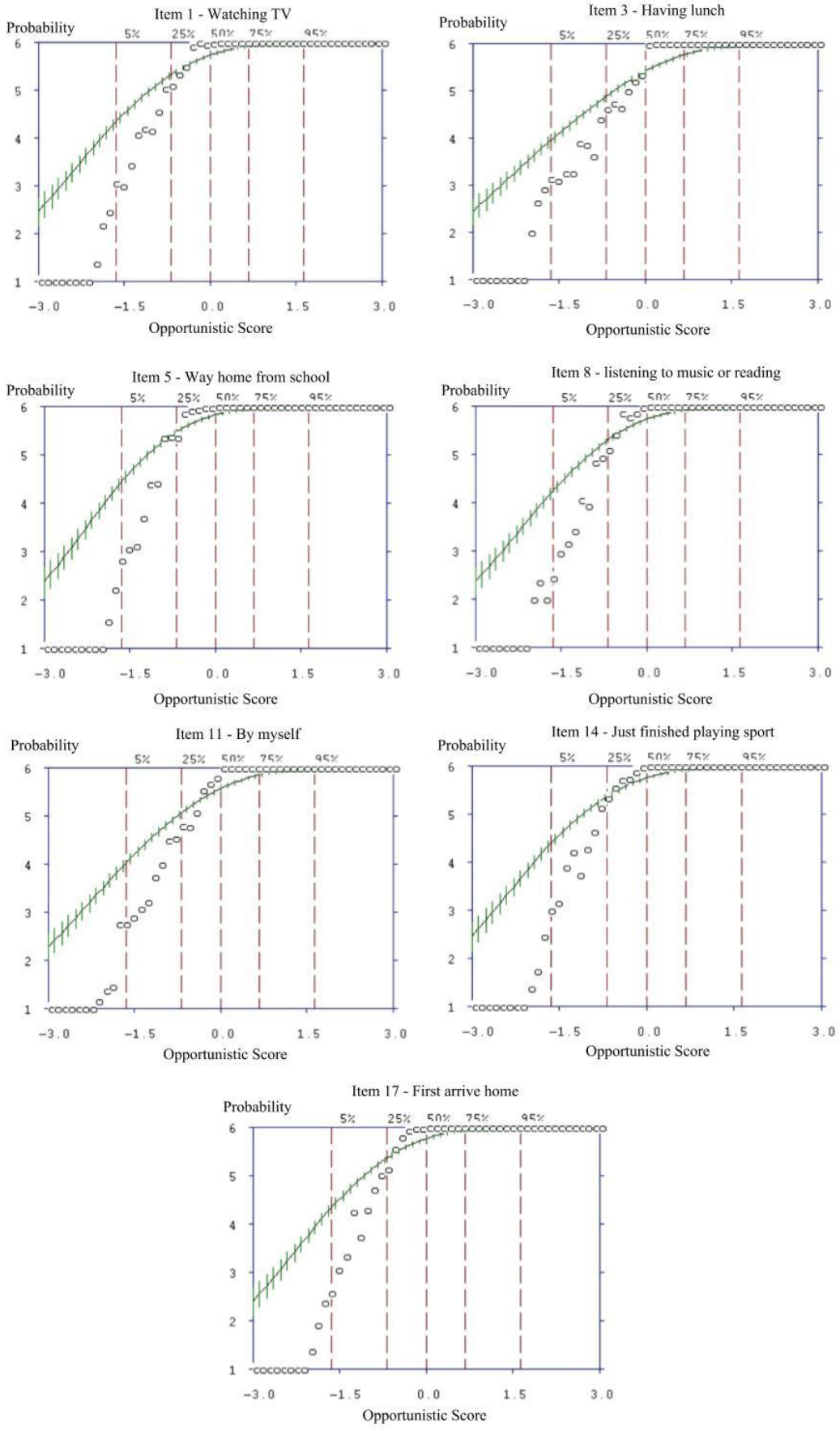
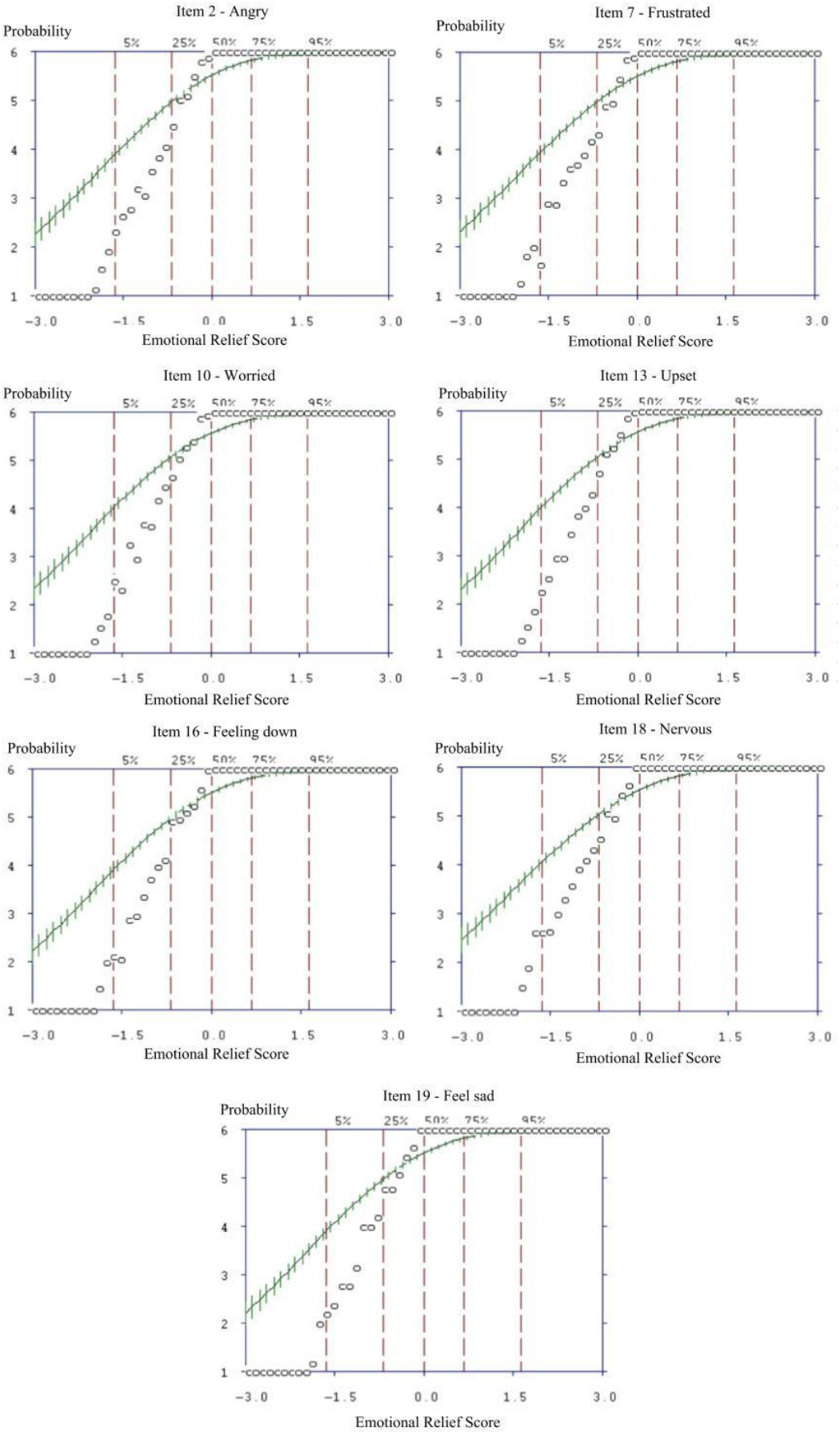


Figure S06. ICCs for the Emotional Relief subscale.



Drinking Refusal Self-Efficacy Questionnaire-Shortened Revised Adolescent version (DRSEQ-SRA)

Directions:
The following items ask you to describe your ability to handle drinking situations. Your answers will be completely anonymous so please try to answer as honestly as you can.
The following pages contain a list of situations in which people may find themselves drinking alcohol. Please circle the number beside each statement which best describes how much you could resist drinking in each case.

I am very sure I could NOT resist drinking	I most likely would NOT resist drinking	I probably could NOT resist drinking	I probably could resist drinking	I most likely could resist drinking	I am very sure I could resist drinking
1	2	3	4	5	6

1.	When I am at a party	1	2	3	4	5	6
2.	When I am listening to music or reading	1	2	3	4	5	6
3.	When my boy/girlfriend is drinking	1	2	3	4	5	6
4.	When my friends are drinking	1	2	3	4	5	6
5.	When I feel upset	1	2	3	4	5	6
6.	When I have just finished playing sport	1	2	3	4	5	6
7.	When I am feeling down	1	2	3	4	5	6
8.	When I first arrive home	1	2	3	4	5	6
9.	When I feel sad	1	2	3	4	5	6

Drinking Refusal Self-Efficacy Questionnaire-Revised Adolescent Version (DRSEQ-RA)

Directions:
The following items ask you to describe your ability to handle drinking situations. Your answers will be completely anonymous so please try to answer as honestly as you can.
The following pages contain a list of situations in which people may find themselves drinking alcohol. Most people find it easier to resist drinking in some of these situations than others. Please circle the number beside each statement which best describes how much you could resist drinking in each case.

I am very sure I could NOT resist drinking	I most likely would NOT resist drinking	I probably could NOT resist drinking	I probably could resist drinking	I most likely could resist drinking	I am very sure I could resist drinking
1	2	3	4	5	6

1.	When I am watching TV	1	2	3	4	5	6
2.	When I am angry	1	2	3	4	5	6
3.	When I am having lunch	1	2	3	4	5	6
4.	When I am at a party	1	2	3	4	5	6
5.	When I am on my way home from school	1	2	3	4	5	6
6.	When someone offers me a drink	1	2	3	4	5	6
7.	When I feel frustrated	1	2	3	4	5	6
8.	When I am listening to music or reading	1	2	3	4	5	6
9.	When my boy/girlfriend is drinking	1	2	3	4	5	6
10.	When I am worried	1	2	3	4	5	6
11.	When I am by myself	1	2	3	4	5	6
12.	When my friends are drinking	1	2	3	4	5	6
13.	When I feel upset	1	2	3	4	5	6
14.	When I have just finished playing sport	1	2	3	4	5	6
15.	When I am at a nightclub/concert	1	2	3	4	5	6
16.	When I am feeling down	1	2	3	4	5	6
17.	When I first arrive home	1	2	3	4	5	6
18.	When I feel nervous	1	2	3	4	5	6
19.	When I feel sad	1	2	3	4	5	6

Figures

Figure 1. Example OCCs for each subscale.

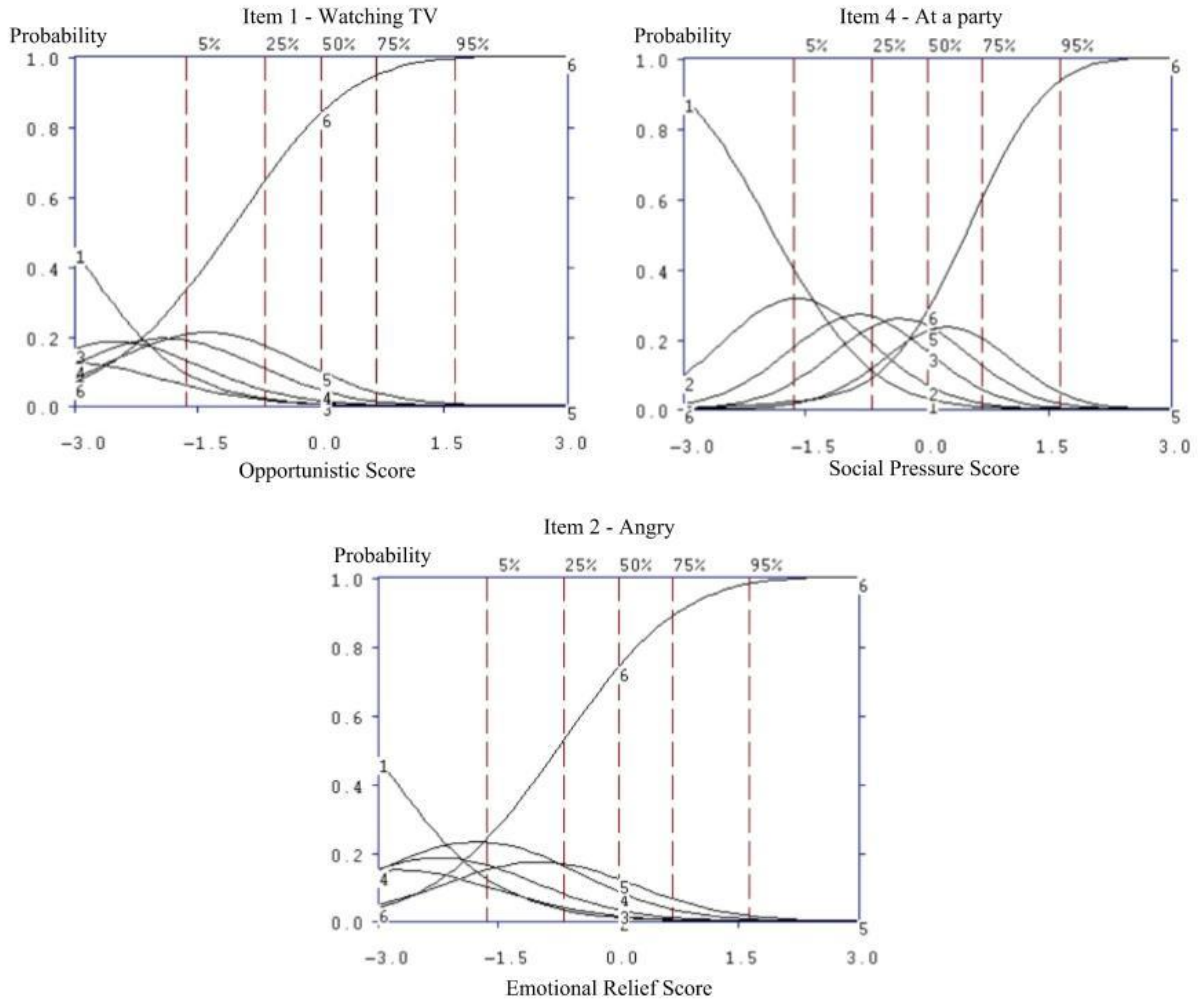


Figure 2. Example ICCs for each subscale.

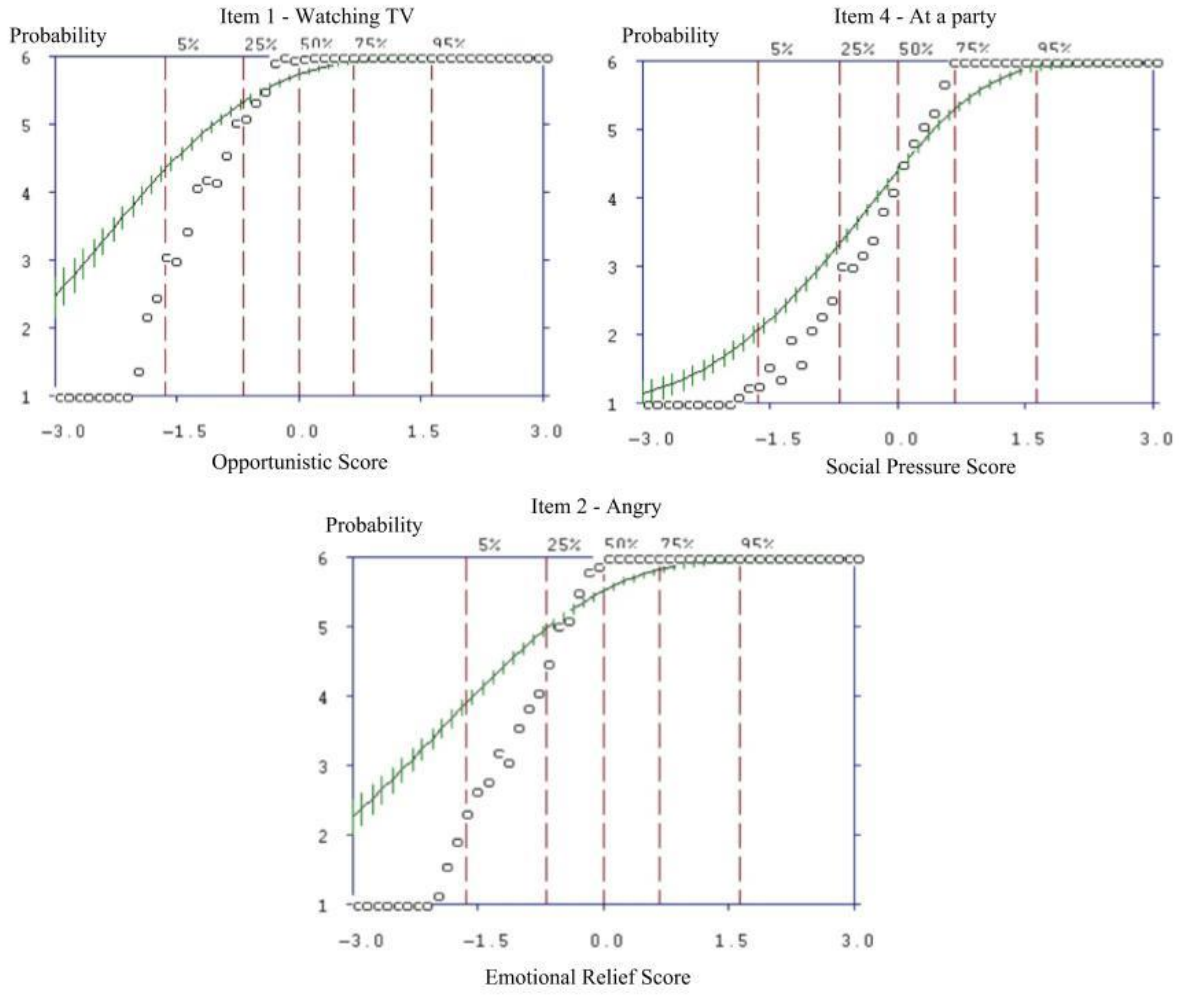
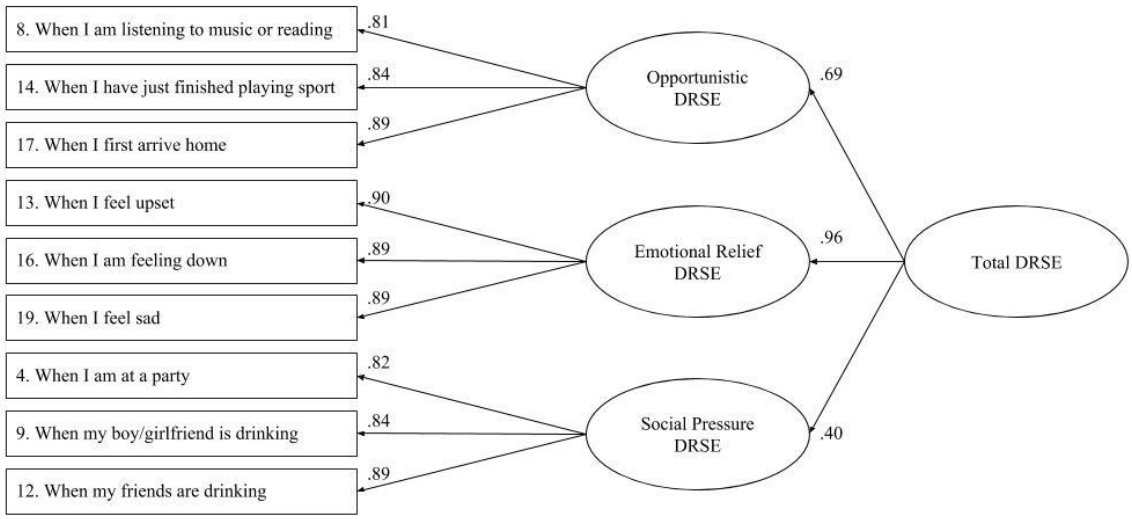


Figure 3. Confirmatory factory analysis model of the DRSEQ-SRA.



Note. Ellipses represent latent constructs, rectangles represent measured variables.

Tables

Table 1.

Descriptive statistics for the AUDIT and DRSEQ-RA scale and subscales (Combined dataset; N = 2,609)

	Minimum	Maximum	Mean	Standard Deviation	Variance
AUDIT	0	40	2.16	4.80	23.08
AUDIT-C	0	12	1.05	2.07	4.28
Social Pressure DRSE	5	30	21.74	7.75	60.04
Emotional Relief DRSE	7	42	36.15	9.13	83.30
Opportunistic DRSE	7	42	37.35	8.10	65.65
Total DRSE	19	114	95.24	22.30	497.36

Table 2.

Model fit indices for the DRSEQ-RA confirmatory factor analyses (Dataset 1; N = 1,324)

Model	χ^2 (df)	CFI	RMSEA	SRMR
1. DRSEQ-RA – 3-factors with total score	384.28* (149)	.85	.04	.04
2. The 19 DRSEQ-RA items as a single scale	566.56* (152)	.70	.05	.06
1. vs. 2. $\chi^2_{diff}(df_{diff})$	182.28(3)*			

Note. CFI, comparative fit index; RMSEA, root-mean-square error of approximation; SRMR, standardised root mean-square residual.

* $p < .001$

Table 3.

Mokken normalised covariance scores (H_i) for the DRSEQ-RA subscale items and Mokken scalability coefficient (H) for the DRSEQ-RA subscales (Dataset 1; N = 1,324)

	Opportunistic	Emotional Relief	Social Pressure
H_1 Watching TV	.758		
H_2 Angry		.826	
H_3 Having lunch	.685		
H_4 At a party			**.819**
H_5 Way home from school	.786$^+$		
H_6 Offered drink			.793
H_7 Frustrated		.825	
H_8 Listening to music or reading	**.765**		
H_9 Boy/girlfriend is drinking			**.799**
H_{10} Worried		.837	
H_{11} By myself	.749		
H_{12} Friends drinking			**.829**
H_{13} Upset		**.856**	

H_{14} Just finished playing sport	**.760**		
H_{15} At nightclub/concert			.797
H_{16} Feeling down		**.845**	
H_{17} First arrive home	**.786**		
H_{18} Nervous		.813	
H_{19} Feel sad		**.846**	
H	.755	.835	.808

Note. Items in bold selected for shortened scale. $^{+}$ item initially selected for inspection for shortened scale but not included in final scale.

Table 4.
Model fit indices for the DRSEQ-SRA confirmatory factor analyses (Dataset 2; N = 1,285)

Model	χ^2 (df)	CFI	RMSEA	SRMR
Shortened 9-item DRSEQ-RA (DRSEQ-SRA)	80.55* (24)	.95	.04	.13

Note. CFI, comparative fit index; RMSEA, root-mean-square error of approximation; SRMR, standardised root mean-square residual.
* $p < .001$

Table 5.
Associations between DRSEQ-RA and DRSEQ-SRA subscales and AUDIT scores (Dataset 2; N = 1,285).

Regression model	**Predictors**	**B**	**β**	***sr²***	***t***	**R**	**$_{adj}R^2$**	***F*-test (df)**
1. DRSEQ-RA	Social Pressure	-.21	-.35	0.07	-10.62**	.43	.18	94.08 (3, 1280)**
	Emotional Relief	.05	.10	0.00	1.73			
	Opportunistic	-.12	-.21	0.01	-3.94**			
2. DRSEQ-SRA	Social Pressure	-.34	-.35	0.08	-10.98**	.43	.19	98.77 (3, 1280)**
	Emotional Relief	.19	.11	0.00	2.34*			
	Opportunistic	-.30	-.24	0.02	-5.71**			
3. DRSEQ-SRA, Emotional Relief	Emotional Relief	-.33	-.29	.09	-10.98**	.29	.09	120.64 (1, 1282)**

**$p < .001$, *$p < .05$.

Table 6.
Associations between DRSEQ-RA and DRSEQ-SRA subscales and AUDIT-C scores (Dataset 2; N = 1,285).

Regression model	**Predictors**	**B**	**β**	***sr²***	***t***	**R**	**$_{adj}R^2$**	***F*-test (df)**
1. DRSEQ-RA	Social Pressure	-.10	-.40	0.09	-12.16**	.43	.18	94.90 (3, 1280)**
	Emotional Relief	.03	.12	0.00	2.25*			
	Opportunistic	-.04	-.17	0.01	-3.22**			
2. DRSEQ-SRA	Social Pressure	-.16	-.39	0.09	-12.14**	.43	.18	94.53 (3, 1280)**
	Emotional Relief	.05	.11	0.00	2.33*			
	Opportunistic	-.09	-.18	0.01	-4.20**			
3. DRSEQ-SRA, Emotional Relief	Emotional Relief	-.13	-.29	.07	-9.95**	.27	.07	99.08 (1, 1282)**

**$p < .001$.

Table 7.
Cronbach's Alpha reliability coefficients for the DRSEQ-RA and the DRSEQ-SRA scales and subscales (Dataset 2; N = 1,285).

Scale and Subscales	Cronbach's alpha
DRSEQ-RA Total	0.97
DRSEQ-RA Opportunistic	0.96
DRSEQ-RA Emotional Relief	0.98
DRSEQ-RA Social Pressure	0.95
DRSEQ-SRA Total	0.94
DRSEQ-SRA Opportunistic	0.94
DRSEQ-SRA Emotional Relief	0.96
DRSEQ-SRA Social Pressure	0.93

Highlights:

- 19-item DSREQ-RA reduced to 9-item scale with similar psychometric properties
- The DRSEQ-RA and DRSEQ-SRA each displayed good reliability and validity
- The DRSEQ-RA and DRSEQ-SRA each explained 18% of variance in alcohol consumption
- The DRSEQ-SRA may be a valuable tool for identifying risk of adolescent drinking
- The DRSEQ-SRA may be a valuable tool for prevention/treatment planning