SCORING AND NORMS FOR THE CTS2 AND CTSPC

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GENERAL POINTS

This document is meant to supplement the scoring information given in the papers on the CTS2 (Straus, Hamby, Boney-McCoy, and Sugarman 1996) and the CTSPC (Straus, Hamby, Finkelhor, Moore, and Runyan 1998).

The CTS is best scored by entering the items into any statistical program such as SPSS, STATA, etc. and using the program to sum the items to obtain the scale scores.

The scoring of the CTS2 and CTSPC is slightly different than the scoring of the CTS1 because the CTS1 did not have a response category of 7 (“Not in the past year, but it did happen before”).

Scales, Subscales, and Scoring Methods

The difficult thing to get on top of is that each of the scales includes subscales. In addition, several scores are possible for each scale and subscale. The many possible combinations of scales and scoring methods is shown in the attached table. Each cell in this table represents a different variable that can be computed. But even that table does not fully encompass the possibilities because there are still other, less frequently used, scoring methods.

Preferred Scores. For research use, Prevalence (the percent who engaged in one or more of the acts in the scale or subscale) is the most frequently used score (see below). For some research purposes, a Chronicity score is also important. For clinical use with a population known to be violence, the preferred scoring method will probably be Annual Frequency.

Referent Period. The "default" referent period for the CTS is the previous year. However, there are circumstances when the CTS should be administered using a different referent period, such as a shorter period to minimize recall bias (e.g. past six months or month), or a "bounded" recall period such as "since starting (completing) the program." In this document, the term Annual Prevalence should be interpreted as referring to whatever referent period was used when the CTS was administered, which could be one of the alternatives just mentioned.

Terminology For Minor, Severe, and Overall Assault

As indicated in the attached table, for most of the CTS scales, there are subscales measuring two levels of severity. In the case of the Physical Assault scale, the items used to score Severe Assault are considered more severe in the sense that they pose a greater risk of injury that would require medical attention than the items used to score Minor Assault. The Overall score measure uses the entire set of 12 items. The terms Minor and Severe have the disadvantage that "minor" might be interpreted as suggesting something that is not a serious problem for either victims or society. If you are presenting results in a context where this misinterpretation might occur, consider using the alternative terms such as Level 1 and Level 2.

Misprints In Article On The CTSPC Which Result In Scoring Errors

These have been corrected in reprints distributed by the Family Research Laboratory, including the reprint in the CTS Handbook. However, if your copy was obtained directly from the journal, see the addendum at the end of this document.
NORMS AND CLINICAL INTERPRETATION OF SCORES FOR INDIVIDUAL CASES

The norms in the CTS Handbook are based on the original CTS and hence do not apply to the revised versions of the CTS. Normative tables for the CTS2 and CTSPC have not yet been developed. However, there is normative information and standards can be applied, as indicated below.

CTS2

Physical Assault, Sexual Coercion, and Injury Scales. The Physical Assault scale indicates whether the respondent engaged in such behavior and the number of times it occurred in the referent period. The individual items should be examined in addition to the scale score because of the different implications of, for example, slapping as compared to punching. The same principle applies to the Injury and the Sexual Coercion scales.

For many clinical purposes, even one instance of a physical assault exceeds the norm. If the clinical population consists of persons who have been violent to a partner, as for example in a batterer treatment group, you can use the mean and standard deviation for the Chronicity scores in Table 4 of paper CTS15 (in the Handbook or on my website) as rough norms to judge how far above and below the mean of others who are also violent.

A limitation of the data in Table 4 is that it is based on University student couples (mostly in dating relationships). The scores for physical assault will be considerable lower for married couples because partner assault declines rapidly with age. The rates for couples in the 18-20 age group are about three times higher than those for couples at the average of couples in the US (about 40).

Psychological Aggression, Negotiation, And Non-Violent Discipline Scales. The chronicity scores in Table 4 in paper CTS15 give the average number of times a sample of men and women college students engaged in those behaviors with their partners and the standard deviations. The means are high because this is a young sample, but with this in mind, and also the fact that it is also a high education sample, comparison of the scores of a client with these means may still be useful.

CTSPC

The same general principles given above for the CTS2 also apply to the CTSPC, except that: (1) Any hitting of a child cannot be considered non-normative because hitting children in the form of corporal punishment is legal in every state in the USA, and a minimum of 94% of parents have done this. Therefore, the criteria can be any instance of one of the Severe Assault items, i.e. a score of one or more on the Severe Assault scale. (2) The means and standard deviations for the chronicity scores in Table 1 of paper CTS17 can be used to determine how far a specific parent is above or below the mean of a nationally representative sample of parents. Note that parents who did not hit the child are not included in the Chronicity score. (3) See also the discussion in the first paragraph of the section on Normative Issues on page 260 of paper CTS17.
Omitted Items

If an item is omitted, the test responses should be discussed with the client before scoring. It may indicate that the respondent engaged in the behavior and did not wish to report. If so, the missing data can sometimes be replaced using the information disclosed at that point.

PREVALENCE AND CHRONICITY SCORES

Except when using the CTS clinically to evaluate a specific case, and except for research on populations who are victims of violence or perpetrators of violence, there is usually a need to create separate scores for the Prevalence and Chronicity of Physical Assault, Sexual Coercion, and Injury.

The need for separate prevalence and assault scores on the Physical Assault scale occurs because, in a non-clinical population, there will usually 70% to 90% with a score of zero. Such an extremely skewed distribution makes the mean, and even the median inappropriate, violates the assumptions of many statistical procedures, and also creates problems with outliers. Moreover, the distribution is so skewed that no transformation is sufficient to normalize it. Separate prevalence and chronicity scores are one way to create meaningful measures of central tendency and to deal with the outlier problem.

The prevalence score enables one to say; for example, that a certain percent of a group experienced a physical assault. The chronicity score enables one to say how often it happened among those who assaulted or were assaulted, for example, 5.3 times during the referent period.

Measures Of Central Tendency. With a distribution as skewed to the zero end as indicated above, the mean will usually result in an uninformative statistic such as a mean of .04 for Group A and a mean of .02 for group B. To have a measure of central tendency that is informative requires a score that describes the frequency only for those who engaged in at least one of the acts, i.e. the chronicity score.

Outliers. The Annual Frequency score (see below) weights the items in the scale by their frequency of occurrence. The scores for the 12 items can range from zero to 300 (12 items * max score of 25 for each item = 300) but most will have scores of 1, 2, or 3. The remainder are stretched out over a range from 4 to 300. This gives tremendous influence to a relatively few outliers with a high frequency of assault. A dichotomy such as the prevalence score is one method of restricting outliers from having an undue influence.

Problems Using Separate Prevalence and Chronicity Scores.

The chronicity score will be available only for the fraction of the sample that engages in physical assaults. Another problem is that, although the combination of the prevalence and chronicity scores provides the most complete description of assaults or injuries, it complicates the data analysis and the research report because many analyses must be computed and reported twice, once for prevalence and once for chronicity.

METHODS OF SCORING

Annual Prevalence

This is the most frequently used type of score for the Physical Assault scale and subscales. The prevalence score indicate whether one or more of the acts in the scale were used during the referent period. Thus, it does not differentiate on the basis of how many of the
acts were used or how often each act was used.

Create dichotomous versions of the items. A score of 1 indicates one or more acts of violence in the past year: Score 1 if there is a response of 1, 2, 3, 4, 5, or 6 to an item. Score zero if there were no violent acts in the past year. (all items answered 0 or 7). Note that you do NOT sum the dichotomous items.

As indicated above, this method assigns a score of 1 (or 100 if you want the mean to be expressed as a percentage) for any subject who reported one or more instances of any of the acts in the scale. The prevalence score is appropriate for the psychological, physical, and sexual assault scales and for the injury scale because, for many purposes, the key issue is the percent of the population in which an assault or injuries during the referent period.

Annual Chronicity

The chronicity score is the sum of the number of times each act in a scale was used by those who used at least one of the acts in a scale. To create a chronicity score:

A. Create chronicity versions of the items by flagging all responses of 0 or 7 as missing data.
B. Sum the chronicity versions of the items.

Ever Prevalence

1 = One or more of the acts occurred in either the past year OR previously: Scored 1 if any violence item is answered 1 through 7
0 = None of the items answered 1 though 7

Annual Frequency

The problem with this score is that, for the Physical Assault scale (and to a lesser extent the Psychological Aggression scale), it is extremely skewed for community samples (for example, 85% with a score of zero). As a result, the mean is not a useful statistic (see example above). However, Annual Frequency is usually the preferred way of scoring the Negotiation scale, and is sometimes appropriate for the Psychological Aggression scales of the CTS2, and for the Non-Violent Discipline Scale and Psychological Aggression scale of the CTSPC.

A. Create recoded versions of all violence items by recoding 7 to be 0, and values of 3 though 6 to be the midpoints as follows: 3 = 4, 4 = 8, 5 = 15, 6 = 25 (an assumed midpoint)
B. Sum the items in the scale.

Cutting Points For Negotiation and Psychological Aggression Scales

In the case of the Negotiation and Psychological Aggression scales, it may be advisable to set a threshold criterion to identify cases to be considered "low" in use of Negotiation or "high" in use of psychological assaults, such as 3 or more instances, 5 or more instances, 10 or more instances, etc (see Straus and Sweet 1992). When the purpose of the analysis is to compare groups, such as married versus cohabiting couples or low and high SES subjects, a percentile, such as the 80th percentile for the combined population, can be used as the division point for the dichotomization.
MISSING DATA

When a respondent has omitted even one of the items in a CTS scale, the choice is to either code the case as a missing value in respect to that scale or subscale and therefore lose the case for analyses involving that scale, or to try to retain the case by using some method for replacing the missing response.

The most usual procedure for replacing missing values is to assign the mean or median. However, in the case of the Physical Assault scale of the CTS2 (or the more severe items in the CTSPC), the mean and median are zero. Consequently, replacing a missing value for an item with a score of zero, in effect, assumes that if the respondent had answered, they would have indicated that they did not engage in the behavior. However the results of a study by McCarroll et al (2000) can be interpreted as indicating that respondents who omit questions on the Physical Assault scale (and by inference also the Psychological Aggression scale) are likely to be people who did engage in the behavior but chose not to report it. Based on this interpretation, the following procedure can be tried.

Prevalence Scores

I suggest coding the scale as indicating having engaged in the behavior if there are any unanswered questions. Note: An answer of Zero is not an unanswered question or missing data. Be careful not to confuse Zero with missing data.

Conditional Replacement For Severe Assault. This is a more conservative method. If one or more of the Severe Assault scale items is missing, code the Severe Assault scale as indicating the presence of assault, but only if the respondent answered at least 2 of the Minor assault items.

Annual Frequency Scores

Replace missing values with a score of 1 for each missing item, for up to 2 missing items on the Psychological Aggression scale, and for up to 3 missing items on the Physical Assault scale. Thus, if there are 3 or more missing items in the Psychological Aggression scale or four or more are missing on the Physical Assault scale, the score on the scale is missing.

Note that if the above method is used, there can be cases with missing data that have had that data replaced for the prevalence score, but did not meet the criteria for the annual frequency score.

Investigate The Effect of Replacement

I recommend that you investigate the effect of replacing missing values as compared to dropping the case. To do this, repeat some cross tabulations, regressions, or ANOVAs for the sample that excludes cases with a missing item and for the sample that includes cases that have been score using the above procedure. Then try to decide if the results are more meaningful with the adjustment for missing data. Be sure to pay attention to the "effect size" as well as significance level because the significant level is influenced by the number of cases. If you do these comparisons, I would be very interested in learning what happened.

TAKING SEVERITY OF ASSAULTS INTO ACCOUNT

The physical assault items differ tremendously in their severity. Some, such as punching
or using a weapon, are much more dangerous than attacks in the form of slapping and shoving. The Minor Assault and Severe Assault subscales were developed to take this important difference into account. But even within those subscales, the items differ in severity. In some circumstances it may be useful to compute scale scores that are weighted by the severity of each item. The main circumstance for using a severity weighted score occurs when testing a population in which all the subjects have been violent during the referent period and the important issue is severity of the violence. An example would be men in a treatment program for partner assault, but even then it may not be the best procedure. Usually the best way to take severity into account is to create subscales for Minor and Severe assault, and use the frequency of occurrence for additional weighting.

Severity Weights

In some publications on the original CTS, I referred to a Severity Weighted Score. The correct name should have been Severity Times Frequency Weighted score. It is computed by multiplying the frequency of an act (i.e., of an item) times a weight for the severity of the act and summing the products. In most situations, it is better to avoid using these severity weights for the following reasons.

Exacerbates Outlier Problem. The resulting score exacerbates the outlier problem even more than does the weighting by frequency of occurrence in the Annual Frequency score described above, and also is difficult to interpret (see below). Consequently, it is probably only appropriate to use this score as a refinement of the Chronicity Score, and even then only under certain circumstances.

Scores Not Intuitively Understandable. Because the Severity Weighted scores are the product of the severity weight times the frequency of occurrence, the resulting scores have no directly perceivable meaning. This is in comparison to a frequency weighted or chronicity score. For example, in a study of men in a treatment program for batterers, using a frequency score, you might find that the treatment group decreased from a mean of 14.2 times to 5.4 times. Thus, according to this hypothetical data, even the treated subjects who remained violent seem to have decreased in how often violent incidents occurred. However, if you use a severity-weighted score, you have to say that the severity weighted scale decreased from (for example) 43.1 to 12.3. But no one knows what either 43.1 or 12.3 is; whereas everyone knows what 14.2 times and 5.4 times is. Nevertheless, there probably are circumstances where the weighted score is worth the statistical and communication problems. In addition, differences that are not otherwise statistically significant might be significant when using the presumably more sensitive measure involving severity (although I have so far not found that to be the case).

Suggested Severity Weights for the CTS2

If there is a situation where severity weights are appropriate, here is what I suggest. Note, that as in the case of the weights suggested for the original CTS, these weights are based on my judgment, not on empirical evidence.

Items 7, 9, 17, 45, 53 = 1
Item 27 and 73 = 3 (weighting item 27 as 3 rather than 2 is the only change from the CTS1)
Item 33, 37, 43, and 61 = 5
Item 21 = 8
Subscales For Minor and Severe Assault

The best way of taking severity into account when using the CTS2 may be to create separate subscale scores for Minor and Severe Assault (CTS2). When using the CTSPC, create separate subscales for Ordinary and Severe Corporal Punishment, and to measure "physical abuse" use Severe assaults subscale. In my opinion, the frequency of occurrence weighting of these subscales provides an adequate measure of severity.

CTSPC Distinction Between Ordinary and Severe Corporal Punishment

When using the CTSPC, the terminology is confusing because the Minor Assault items, which are used as a measure of corporal punishment by parents, are subdivided into Ordinary and Severe corporal punishment. The confusion is because the word severe is also applied to all the items that are not in the Minor Assault category.

The "ordinary" corporal punishment items are H and P, and the severe corporal punishment items are D, R, and V. Item C (shake) is classified as ordinary for children age 2 and over, but as "maltreatment" rather than corporal punishment for children under 2 because it is so dangerous for young children. See Straus and Stewart (1999) for an example of use of the above classification. If you are working from a reprint of the article on the CTSPC taken directly from the journal, see the addendum below.

SCORING USING SPSS AND OTHER STATISTICAL PROGRAMS

The following steps illustrate use of SPSS, but the principles are the same when using other statistical packages.

Create A File Of The Items and Case Identification Information

There should be a row for each case and a column for each item.

The first column is the case identification number that you assign to each case. The next columns are for demographic and family characteristics such as age, sex, whether married or cohabiting etc. This is followed by the scores for each CTS item. The order of the columns is not important, but it is critical to include a case identification number.

I suggest using CQ as the first letters of the "Variable Name" for CTS items, .e.g., CQ1, CQ2, CQ3 etc.

Create Recoded Versions Of The Items

The different scores must be created using versions of the items that have been recoded into the form needed for the type of scale score you want. The two most frequently used scores are Annual Prevalence and Yearly Frequency. It is essential to carefully follow the scoring instructions in the 1996 article on the CTS1 (pages 305-306) or the 1998 article on the CTSPC (page 263). Be especially careful about recoding category 7.
I suggest using the following suffixes to the “variable names” to identify the nature of the recode:

C   Chronicity
E   Ever
P   Annual Prevalence
Y   Yearly frequency

To create recoded versions of each item, click on Transform and then Into New Variable.

Type in the variable name for the recoded version of the item using the above suffixes. For Prevalence versions of the items, the variable names would be CQ1P, CQ2P, CQ3P etc., whereas for Yearly Frequency versions they would be CQ1Y, CQ2Y, CQ3Y etc.

There should be a recoded item for each raw score item. Thus, if you want to create scale scores for Prevalence and scores for Annual Frequency, you would need three sets of items: the items in their original form, the items recoded to prevalence form, and the items recoded to annual frequency form.

Compute Scale Scores

Click on Transform and then Compute.

Type in the variable name for the CTS scale score. I suggest using CX to indicate all scale scores (compared to CQ for the items), and the following codes to indicate which scale:

1 Negotiation (CTS2) or Non-Violence Discipline (CTSPC)
2 Psychological Aggression
3 Physical Assault
4 Injury (CTS2)
5 Sexual Coercion (CTS2)
6 Neglect (CTSPC)
7 Sexual Abuse (CTSPC)

Letters To Identify Minor, Severe, and Total. In addition to the above number codes to identify the different scales, you also need to identify whether the score is for minor or severe subscales or the overall (total) scale. To do this, use the suffixes M, S, and T.

"Variable Labels are also important because, with an limit of 8 characters, the "variable name" requires extreme abbreviations that, a month or two later, you will have trouble figuring out unless there are also Variable Labels.

Here are some examples of the Names and Labels for minor and severe subscales of Physical Assault, and for prevalence and annual frequency scores for each.

<table>
<thead>
<tr>
<th>Var Name</th>
<th>Var Label</th>
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<tr>
<td>CX3MP</td>
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<tr>
<td>CX3SP</td>
<td>&quot;        Severe, &quot;</td>
</tr>
<tr>
<td>CX3MY</td>
<td>Physical Assault, Minor, Year Frequency</td>
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</table>
General Cautions

Run Frequencies for each of the items and inspect the frequency distributions before starting to compute scale scores. There may be errors in typing in the data, such as a score of 8 when the maximum is 7.

Run Frequencies for each scale score as soon as you have computed the scale score and look it over carefully. Errors from wrong syntax are common and you will not know that the score is wrong unless you look at the frequency distribution carefully for impossible values, degree of skewness, etc.

Converting “Self” and “Respondent” To Gender-Specific Variables

The standard mode of administering the CTS asks the respondent to respond to each item twice, first to describe his/her own behavior and then to describe the behavior of the partner. This provides scores for the respondent and the partner, not for males and females, unless all respondents are the same gender. If both male and female respondents were tested, it is often desirable to create gender-specific versions of CTS variables. However, when this is done, it is necessary to keep in mind that half the data on each gender has been provided by the partner rather than the respondent. Whether data provided by the partner is less accurate or more accurate than data provided by the respondent is a subject of controversy.

The SPSS syntax to create gender-specific versions of a CTS variable is:

IF (sex of respondent = male) CTS male partner variable X = variable name for respondent's own behavior for variable X.
IF (sex of respondent = female) CTS male partner variable X = variable name for the partner's behavior for variable X.
IF (sex of respondent = female) CTS female partner variable X = variable name for respondent's own behavior for variable X.
IF (sex of respondent = male) CTS female partner variable X = variable name for the partner's behavior for variable X.

ADDENDUM TO ARTICLE ON THE CTSPC

The article in Child Abuse and Neglect, 1998, Volume 22, No. 4, pp pages 249-270 should be corrected as follows (These corrections have been made in reprints distributed by the Family Research Laboratory and in the CTS Handbook):

Page 255, Table 1, item M should be scalded (not scolded)
Page 256, line 6: The items in the Severe Physical Assault subscale include item I (not item L).
Page 268, right column: Item V should be scored as part of the Minor Physical Assault subscale, not as part of the Severe Physical Assault subscale.
REFERENCES


<table>
<thead>
<tr>
<th>SCALE AND SUBSCALE</th>
<th>FOUR METHODS OF SCORING</th>
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<td>PREVALENCE</td>
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<td>Physical Assault</td>
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<td>Minor (Corporal Pun.)</td>
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<tr>
<td>Severe (“abuse”)</td>
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