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Factor Similarity of the Conflict Tactics Scales Across Samples, Spouses, and Sites: Issues and Implications

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Wide variations in prevalence estimates of marital aggression point to the absence of a uniform and adequate definition of marital aggression. To focus on the construct validity of Straus' (1979) Conflict Tactics Scales, the most frequently used measure of marital aggression, two studies were conducted. Based on responses to the Conflict Tactics Scales, two consistent factors (viz. Physical and Psychological Aggression) emerged in separate samples of 187 couples seeking therapy for marital problems, and 398 nonclinic couples in beginning marriages. The factor structure was consistent across clinic and nonclinic samples, sex, geographical sites, time, and socioeconomic status. Implications for the measurement of interspousal physical aggression are raised (e.g., mild, moderate, and severe aggression load on the same factor) and appropriate directions for further research on the construct validity of the Conflict Tactics Scales are suggested (e.g., conducting similar factor analyses on aggressive couples).

KEY WORDS: marital violence; spouse abuse; assessment; factor analysis; conflict tactics scale.

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INTRODUCTION

It has become increasingly apparent since the early 1970s that relationship aggression in the United States is commonplace.[4] However, there is a wide range in estimates of the prevalence of physical aggression in both dating and marital relationships, ranging from 10% to 60% (e.g., Arias *et al.*, 1985; Bernard and Bernard, 1983; Cate *et al.*, 1982; Gelles, 1974; Hornung, *et al.*, 1981; Lent, 1986; Makepeace, 1981; O'Leary *et al.*, 1986; Schulman, 1979; Straus, 1978, 1979; Straus and Gelles, 1986; Straus, *et al.*, 1980). While many studies have documented the prevalence of relationship aggression, few attempts have been made to explain these wide variations in prevalence estimates.

At least three factors might account for any discrepancies in prevalence estimates. *First,* prevalence rates depend on the time period over which spouses rate the occurrence of aggression. That is, the prevalence of interpartner aggression is dependent on whether respondents rate whether aggression has ever occurred in their relationship, or whether aggression has occurred in a limited time period, such as the previous year (e.g., Straus *et al.*, 1980). *Second,* prevalence rates are dependent on the source of the information, as there is only moderate agreement between partners in reports of aggression (Browning and Dutton, 1986; Jouriles and O'Leary, 1985; Szinovacz, 1983). More importantly, prevalence rates are also a function of the definition and assessment of interpartner aggression. The present study will focus on relationship aggression as defined by the CTS. Although many studies have employed Straus' (1979) Conflict Tactics Scales (CTS) to operationalize physical aggression (e.g., Barling and Rosenbaum, 1986; Cate *et al.*, 1982; Gully and Dengerink, 1983; Mitchell and Hodson, 1983; O'Leary *et al.*, 1986; Rosenbaum and O'Leary, 1981; Schumm *et al.*, 1982; Straus and Gelles, 1986), not all studies do so. For example, Makepeace (1981) includes some behaviors in operationalizing physical aggression that do not appear in Straus' (1979) physical aggression index (e.g., struck with object, assault with lethal weapon, and choked), as do Hudson and McIntosh (1981; e.g., nonconsensual sex). Makepeace (1981) also excludes some of the frequently occurring aggressive behaviors that Straus (1979) includes (e.g., kicked, bit). The inclusion of nonspecific items [e.g., any "other" aggressive behaviors (Makepeace, 1981)] contributes further to definitional and operational variations in physical aggression across studies.

Even within this widely used instrument, it is unclear how to operationalize physical aggression. More specifically, even when Straus' (1979) CTS are used to operationalize marital aggression, the validity of the different

[4]Although the terms "abuse" "violence," and "aggression" have typically been used interchangeably in previous research, only "aggression" will be used here since it is less emotionally laden than abuse or violence.

physical aggression indices (e.g., "moderate" and "severe" aggression) is questionable. Straus (1979) himself conducted a factor analysis, the results of which do not necessarily support the independence of different dimensions of physical aggression. Rather, all physical aggression items (viz. items 11-18 on the CTS) loaded on the same factor (see Straus, 1979, pp. 80-82). In a separate factor analysis of the CTS, Schumm *et al.* (1982) also found that physical aggression loaded on a single factor. They concluded that there is strong support for a single physical aggression factor, even though item 9 ("*threatened* to hit or throw something"; which Straus uses to calculate the Psychological Aggression index) loaded on their Physical Aggression factor. An examination of Straus' (1979) factor analytic results, however, shows that items 9 and 10 ("threw, smashed, hit or kicked something") also loaded on the Physical Aggression factor.

There is little agreement, therefore, concerning an adequate definition of marital (or interpartner) aggression despite the increased public and scientific attention on family aggression since the late 1960's (Straus and Gelles, 1979). Until there is agreement as to the definition of marital aggression, prevalence rates will vary across studies. Further, and more importantly, studies of the predictors, correlates, and outcomes of marital aggression may yield inconsistent results because of variations in the operationalization of marital aggression.

The two studies to be reported here assess the internal structure of the CTS, by conducting a series of factor analyses on Hornung *et al.'s* (1981) revision of Straus' (1979) CTS. Although factor analyses already have been conducted on data from the CTS (e.g., Hornung *et al.,* 1981; Jorgensen, 1977; Schumm *et al.,* 1982; Straus, 1979), with two studies on very large, randomly selected samples (*N*'s of 2143 and 1553 in Straus (1979) and Hornung *et al.'s* (1981) studies respectively), several problems preclude generalization. *First,* Hornung *et al.* (1981) only factor analyzed women's self-reports of aggression. *Second,* although Hornung *et al.* (1981) and Straus (1979) found evidence of a Life Threatening Behavior factor (i.e., beat up; *threatened* or used a knife or a gun), it may be an artifact of the typically low base rates of such behaviors among community samples. As a result, it is important to factor analyze data from the CTS for individuals with higher base rates of marital aggression. *Third,* neither Straus (1979), Schumm *et al.* (1982), nor Hornung *et al.* (1981) provide data [e.g., eigenvalues, communalities; and in some case, also item loadings (e.g., Hornung *et al.,* 1981; Jorgensen, 1978; Schumm *et al.,* 1982)] normally required to facilitate conclusions from factor analytic data (Comrey, 1978; Maher, 1978). To enhance the generalizability of any findings, the present two studies are conducted on diverse samples. This permits an examination of the consistency of the factor structure of the CTS in several ways: (a) across clinic and nonclinic samples, (b) between men and women, (c) across previous studies and the

present one. The first study focuses specifically on couples seeking marital therapy, whereas the second study focuses on nonclinic couples 6 months into their first marriage.

STUDY I

Method

Subjects

The subjects in this first study were 187 couples who had requested treatment for marital discord. These couples had been married for an average of 9.8 years (range: 0-38 years, SD = 8.65) and had an average of two children per family (range: 0-9, SD = 1.98). The average annual family income (husband and wife combined) was $33,830 (range: $5,000-150,000) Husbands were slightly older (M = 37.02 years, SD = 8.5) than their wives (M = 34.65 years, SD = 7.97; matched pairs $t(178) = 8.08$, $p < 0.001$, two-tailed), and had completed more years of formal education (M = 14.09 years, SD = 2.6 vs. M = 13.19 years, SD = 2.33; matched pairs $t(172) = 3.32$, $p < 0.001$, two-tailed). Wives were less satisfied with their marriages than their husbands as measured by Locke and Wallace's (1959) Short Marital Adjustment Test (husbands: M = 73.96, SD = 28.16; wives: M = 68.72, SD = 30.4; $t(177) = 2.23$, $p < 0.05$).

Instruments

Conflict Tactics Scales. The CTS (Straus, 1979) is an 18-item self-report scale assessing the occurrence and frequency of behaviors engaged in during interpersonal conflict. The items include rational problem-solving behaviors (e.g., "got information to back up your side of things"), psychological aggression (e.g., "did or said something in spite of him/her"), and various levels of physical aggression (e.g., "kicked, bit or hit him/her with a fist," "*threatened* him/her with a kife or gun"). The CTS yields high internal reliability (Straus *et al.*, 1980) and moderate interpartner agreement (Jouriles and O'Leary, 1985; Arias and O'Leary, 1986).

In the present study, Hornung *et al.*'s (1981) revision of Straus' CTS was completed by all subjects with three additional modifications. *First,* a 3-point rating scale was used (0 = no aggression; 1 = a single instance of the aggressive act; 2 = two or more instances of the aggression) instead of the seven-point rating scale. The 3-point rating scale is more appropriate because of the highly skewed nature of the item distributions when using

all seven points of the CTS, which arise as repeated instances of the same aggressive behavior are rare. *Second,* item 18 ("used a gun or knife") was excluded from all analyses for two reasons. Not only is its occurrence extremely infrequent but also there were strong suggestions that item 18 is misinterpreted: People endorsing this item often do so mistakenly in the context of their occupation (e.g., police, military). Also, preliminary analyses suggested consistently that item 18 was not appropriate for inclusion in a common factor model.

Third, Hornung *et al.*'s (1981) revision of the CTS includes the same behaviors as Straus' (1979) CTS, and assesses not only the self-report of aggression, but also each spouse's report on the aggression of his/her partner. Given the problem of modest agreement between spouses in reports of marital behaviors in general (Jacobson and Moore, 1981), and marital aggression in particular (Browning and Dutton, 1986; Jouriles and O'Leary, 1985; Szinovacz, 1983), Hornung *et al.*'s (1981) revision is preferable because it provides self- and spouse ratings of marital aggression. Thus, in the present study, averaged couple data (i.e., husbands' self-rating and wives' ratings of the husband; wives' self-ratings and husbands' ratings of his wife) were used in generating separate indices of husbands' and wives' aggression. Averaged ratings of behavior derived from two different sources are more reliable and valid than data from a single source (Horowitz *et al.,* 1979; Strahan, 1980). This practice of averaging ratings (see Straus, 1979) has been followed in averaging parents' ratings of child abuse and interspousal violence (Jouriles *et al.,* 1986; Wolfe *et al.,* 1985).

Short Marital Adjustment Test (SMAT). The 15-item SMAT (Locke and Wallace, 1959) remains one of the most frequently used self-report measures of global marital (or relationship) satisfaction (O'Leary and Turkewitz, 1978). The SMAT is internally reliable and temporally stable over a three month period (MacEwen and Barling, 1986), and consistently differentiates between distressed and nondistressed marital relationships (e.g., Barling and Rosenbaum, 1986; Rosenbaum and O'Leary, 1981).

Procedure

All couples presented themselves for marital treatment at the University Marital Therapy Clinic, Department of Psychology, SUNY at Stony Brook. As part of the initial assessment battery, both spouses completed the CTS and the SMAT.

RESULTS

Two analyses were undertaken prior to the computation of any factor analysis to assess whether the data obtained were suitable for a factor analytic

approach. Initially, all items were inspected to ensure their occurrence was endorsed. Second, Kaiser's (1970) Measure of Sampling Adequacy (MSA) was computed to ascertain whether (a) the common factor model was appropriate to the scale as a whole, and (b) the MSA for each individual item was acceptable. Where either of these two criteria were violated, item elimination was necessary.

In all factor analyses, a minimum residual solution with varimax rotation [one of the most widely used factor approaches (Fullagar, 1986; Kim and Mueller, 1978)] was computed. For all analyses, the Scree test and minimum eigenvalue measure were used to determine the number of factors to be extracted. Only items with communalities ≥ 0.20 and loadings ≥ 0.40 on a factor were considered to contribute significantly to the meaning of a factor. Finally, to enhance interpretability, factors had to account for 10% of the variance, "doublets" were not considered as meaningful factors, and in the case of dual loadings, only the highest loading was used in interpreting the factors.

Reports of Husbands' Aggressive Behavior

An initial examination showed that the data from the 17-item revised CTS was appropriate for the common factors model. An overall MSA of 0.88 was yielded, and the individual MSAs for all 17 items were satisfactory (see Table I; endorsement frequency for all items also appear in all factor analytic tables).

The first factor that emerged accounted for 36% of the variance. An examination of the items loading on this factor (i.e., items 9, 11-17) suggests strongly that it be labeled *Physical Aggression.*

However, unlike previous approaches to conceptualizing marital aggression (e.g., Straus *et al.,* 1980), "mild" and "severe" aggression were not separate. In addition, like previous research (Schumm *et al.,* 1982; Straus, 1979) items 9 ("*threatened* to hit him/her or throw something at him/her") and 10 ("threw or smashed or hit or kicked something") contributed to the physical aggression factor here.

A potential threat to the interpretability of the first factor, however, is the multiple loading of items 9 and 12 across the first and second factors. To assess whether multiple loadings influence the interpretation of a factor, a simplified index is generated omitting any item with multiple loadings differing by more than 0.05. The simplified index is then correlated with the factor score (Fullagar, 1986). The simplified index generated here was substantially correlated ($r = 0.93, p < 0.001$) with the factor score (which was com-

Table I. Factor Structure of the CTS for Husbands in Clinic Sample (N = 187)

CTS Item	Factor loadings 1	2	3	4	h^2	MSA	Percentage endorsement
15. Hit/tried to hit her with a fist	0.90				0.82	0.92	39.6
16. Beat her up	0.89				0.84	0.84	31.6
14. Kicked/bit/hit her with a fist	0.85				0.73	0.95	37.4
11. Threw something at her	0.85				0.76	0.93	44.9
13. Slapped her	0.82				0.73	0.95	45.5
17. *Threatened* her with a knife/gun	0.76				0.72	0.83	27.8
9. *Threatened* to hit her or throw something at her	0.67	0.51			0.73	0.91	61.5
12. Pushed, grabbed or shoved her	0.61	0.57			0.71	0.92	63.1
4. Insulted or swore at her		0.82			0.67	0.82	94.1
8. Did/said something in spite of her		0.82			0.55	0.83	94.1
6. Stomped out of the room/house/yard		0.73			0.61	0.82	90.4
5. Sulked or refused to talk about an issue		0.65			0.54	0.74	97.3
10. Threw/smashed/hit/kicked something	0.42	0.58			0.57	0.90	76.5
7. Cried			0.81		0.69	0.71	77.0
3. Brought in or tried to bring in someone to help settle things			0.67		0.64	0.82	70.1
2. Got information to back up your side of things				0.88	0.80	0.57	96.3
1. Discussed issue calmly				0.58	0.55	0.85	99.5
Eigenvalue:	6.13	3.18	1.26	1.12			
Variance:	36.0	18.7	7.4	6.6			

puted using regression estimates; Kim and Mueller, 1978), suggesting that the interpretability of this Physical Aggression factor is not confounded by the multiple loading of items 9 and 12.

The second factor that emerged accounted for 18.7% of the variance. Following an examination of the items (see Table I) this factor was labeled *Psychological Aggression,* and largely replicates previous psychological abuse indices with two exceptions: Neither items 7 nor 9 loaded on the present factor, although item 7 was part of both Straus' (1979) and Hornung *et al.*'s (1981) psychological aggression indices.

Again, however, the integrity of this Psychological Aggression factor may be comprimised by the dual loading of item 10. A simplified index removing this item was again constructed, and the correlation between the factor score and the simplified index ($r = 0.97, p < 0.001$) suggests that the interpretation of the Psychological Aggression factor is not affected.

As averaged ratings across all items (i.e., husbands' self-report/wives' reports of husbands; and wives' self-report/husbands' reports of wives) were used to enhance the reliability of the CTS, the internal consistency of the Physical and Psychological Aggression factors was assessed. In both instances, the formula presented by Strahan (1981) was used, wherein alpha is calculated as

$$\frac{kr}{[1 + (k - 1)r]}$$

where r denotes the average interrater correlation, and k denotes the number of raters. Using this formula, the internal consistency of the husbands' (alpha = 0.76) and wives' (alpha = 0.78) Physical Aggression and Psychological Aggression factors (husbands' alpha = 0.51, wives' alpha = 0.63), is satisfactory.

Although two additional factors emerged, neither was considered to be psychologically meaningful. Both were doublets, and neither accounted for more than 10% of the variance.

Reports of Wives' Aggressive Behavior

All of the 17 items yielded acceptable MSA's (see Table II), and the overall MSA for the 17-item scale in this analysis was most satisfactory (0.85).

Two interpretable factors again emerged when analyzing the CTS data for wives. Items 9-17 loaded on the first factor and this factor (which accounted for 35.1% of the variance) was again labeled *Physical Aggression.* Likewise, the second factor that emerged (items 4-8, accounting for 22.1% of the variance) paralleled that of the husbands' self-report of *Psychological*

Table II. Factor Structure of the CTS for Wives in Clinic Sample (N = 187)

CTS Item	Factor loadings 1	2	3	4	h^2	MSA	Percentage endorsement
11. Threw something at him	0.87				0.77	0.93	51.3
15. Hit/tried to hit him with a fist	0.85				0.82	0.88	40.6
14. Kicked/bit/hit him with a fist	0.84				0.72	0.93	41.2
12. Pushed, grabbed or shoved him	0.80				0.71	0.91	60.4
9. *Threatened* to hit him or throw something at him	0.80				0.73	0.88	58.3
13. Slapped him	0.77				0.66	0.93	51.3
10. Threw/smashed/hit/kicked something	0.72				0.60	0.87	66.8
17. *Threatened* him with a knife or gun	0.58				0.79	0.82	31.0
16. Beat him up	0.53	−0.49			0.74	0.82	27.3
4. Insulted or swore at him		0.82			0.72	0.80	92.5
5. Sulked or refused to talk about an issue		0.76			0.60	0.78	97.3
6. Stomped out of the room/house/yard		0.75			0.69	0.84	88.8
7. Cried		0.68			0.52	0.93	98.4
8. Did/said something in spite of him		0.64			0.60	0.79	95.2
3. Brought in or tried to bring in someone to help settle things			0.77		0.69	0.78	75.4
1. Discussed issue clamly			−0.47		0.57	0.90	98.9
2. Got information to back up your side of things				0.91	0.85	0.71	95.7
Eigenvalue:	5.96	3.75	1.05	1.02			
Variance:	35.1	22.1	6.2	6.0			

Aggression with two exceptions: (a) Item 7 ("Cried") contributed to the *Psychological Aggression* factor for the wives, but not for husbands, but (b) item 10, which contributed to this factor for husbands, did not do so for wives.

Neither the third nor fourth factors that emerged in factor analyzing the CTS data for wives were considered further as their psychological interpretability was questionable. The third factor was a doublet, the fourth contained only one item, and neither explained more than 10% of the variance.

STUDY II

There are several reasons why the results of the first study may be sample specific to some extent, and not generalizable to a sample of satisfied couples. First, marital discord is correlated with physical relationship aggression (Barling and Rosenbaum, 1986; Rosenbaum and O'Leary, 1981). Thus, the base rate of physical aggression may be higher amongst couples presenting for treatment for marital distress. Also the occurrence of more severe aggressive behaviors is likely to be higher in maritally discordant couples. Certainly the prevalence of marital aggression was far higher amongst the couples requesting marital therapy in the first study than previously reported prevalence rates. For example, using self-report of aggression, 74% of the husbands and 73% of the wives in the first study reported the use of physical aggression (i.e., endorsement of any of items 11-17 on the CTS; see Tables I and II). Second, items 16 and 17 loaded on the general physical aggression factor across both analyses in Study I, yet in Hornung *et al.*'s (1981) analyses, items 16-18 loaded on a separate factor, labeled Life Threatening Behavior. It is possible that the occurrence of the behaviors represented by these three items in Hornung *et al.*'s (1981) community sample was so low that their emergence as a separate factor was a statistical artifact. To assess the generalizability of the results from the first study, this second study assesses the factor structure of the CTS amongst a nonclinic group of individuals in beginning marriages.

METHOD

Subjects

Data for this second study were obtained from 398 couples participating voluntarily in a longitudinal study of beginning marriages. The subjects were recruited in two geographically separated counties in New York State (viz. Onondaga and Suffolk counties).

No differences emerged across couples within the two sites on age (overall M = 24.79 years, SD = 3.45), length of time they had been dating (overall M = 38.38 months, SD = 27.58) or engaged (overall M = 12.44 months, SD = 9.11), or interpartner adjustment as measured by the SMAT (Locke and Wallace, 1959; overall M = 122.36, SD = 17.83). However, both income and education were significantly lower among Onondaga conty subjects (M income = \$14,245, SD = 6.98; M education = 14.24 years, SD = 2.13) than their Suffolk county counterparts (M income = \$16,349, SD = 7,241, $t(794) = 4.17$, $p < 0.01$; M education = 14.9 years, SD = 2.15, $t(794) = 4.17$, $p < 0.01$), suggesting subjects from Suffolk county were of a higher socioeconomic status.

Across both sites, men were significantly older than women (M = 25.7 years, SD = 3.66 vs. M = 23.9 years, SD = 2.96; $t(794) = 7.59$, $p < 0.01$). Men reported lower relationship satisfaction than women (M = 121, SD = 18.1 vs. M = 124, SD = 17.5, $t(794) = 2.3$, $p < 0.05$). Unlike the couples requesting marital therapy, 12% of the men and 18% of the women scored below 100 on the SMAT, a score frequently taken as indicative of a relationship "at risk" (Barling and Rosenbaum, 1986; Rosenbaum and O'Leary, 1981).

Instruments

The two scales used in the first study, viz. Hornung *et al.*'s (1981) revision of Straus' (1979) CTS and Locke and Wallace's (1959) SMAT were completed by all 398 couples. Both scales were scored in the identical manner described in the first study.

Procedure

This second study is based on the data collected from the 398 couples participating in the study on the etiology of marital aggression. Couples completed questionnaires 1 month prior to their marriages, and again 6 and 18 months following their marriages. The primary analyses reported herein are based on the data obtained six months following marriage. A detailed description of subject recruitment is presented elsewhere (O'Leary *et al.*, 1986).

RESULTS

Previous factor analyses of the CTS suggest strong similarity between the factor structure for husbands' and wives' aggression. To assess the comparability of the factor structure, the Root Mean Square statistic can be calculated (Levine, 1977). The RMS was computed rather than the coeffi-

cient of congruence, which yields artificially high coefficients whenever items across two factors yield the same algebraic sign, a situation achieved in all instances in the present analyses. RMS coefficients can range between 0 and 2; with a perfect pattern-magnitude match denoted by 0, and a score of 2 denoting all loading across the two studies are equal to unity but of opposite signs. No significance tests are available for the RMS, however, as the sampling distribution is not known.

A reanalysis of Straus' (1979) CTS data suggests there was substantial similarity across husband-to-wife and wife-to-husband self-reports of both physical aggression and psychological aggression (RMS: 0.13 and 0.06, respectively). In addition, data from the marital clinic sample in Study I also suggested the similarity of averaged reports of Physical and Psychological Aggression (RMS: 0.19 and 0.16, respectively). As a result, the averaged CTS data for husbands' and wives' was pooled for the purposes of this second study.

As in the previous study, all data were inspected before computing any factor analyses to ensure that all items of the CTS were endorsed, and that all data were suitable for the common factor model (see Table III). The CTS data for the total sample 6 months after marriage was suitable for the common factor model (MSA = 0.89). A principal components analysis strongly suggested the interpretability of two factors (see Table III). Items 9-15 loaded on the first factor, which accordingly was labeled *Physical Aggression.* This factor accounted for 33.7% of the variance. The second factor (explaining 11.3% of the variance) comprised items 5-8, and was labeled *Psychological Aggression.*

The dual loading of item 10 across both *Physical* and *Psychological Aggression* represents a potential threat to the interpretability of the first factor. To assess whether this multiple loading influenced factor interpretation, a simplified index was constructed for the primary factor (i.e., factor 1). The correlation between the factor score and the simplified index (r = 0.80, $p < 0.001$) suggests that the dual loading exerts no influence on the interpretation of the primary factor. The third factor (items 16 and 17) was a "doublet" (see Table III), and both the third and the fourth factors accounted for less than 10% of the variance. Thus, neither the third nor fourth factors were considered.

Using Strahan's (1980) formula, both the Physical Aggression (alpha = 0.88) and the Psychological Aggression (alpha = 0.77) factors were internally consistent.

A major consideration in assessing the construct validity of any questionnaire is the replicability of the factor structure (Briggs and Cheek, 1986). To assess the replicability of the structure obtained, the entire sample was partitioned along five meaningful dimensions: sex of aggressor, geographical site, income and educational differences (as there were differences across the two

Table III. Factor Structure of Conflict Tactics Scales 6 Months Postmarriage (N = 796)

CTS Item	Factor loadings 1	2	3	4	h^2	MSA	Percentage Endorsement
15. Hit/tried to hit him/her with a fist	0.79				0.65	0.88	19.1
12. Pushed, grabbed or shoved him/her	0.77				0.68	0.90	43.4
14. Kicked/bit/hit him/her with a fist	0.70				0.53	0.90	23.8
13. Slapped him/her	0.76				0.64	0.93	30.1
9. *Threatened* to hit/throw something	0.76				0.68	0.94	37.9
11. Threw something at him/her	0.77				0.64	0.89	25.8
10. Threw/smashed/hit/kicked something	0.64	0.40			0.59	0.93	51.5
5. Sulked/refused to talk about an issue		0.71			0.52	0.88	97.0
6. Stomped out of the room/house/yard		0.76			0.65	0.89	84.4
8. Did/said something in spite of him/her		0.71			0.66	0.92	82.1
4. Insulted/swore at him/her		0.66			0.58	0.91	89.3
7. Cried		0.52			0.33	0.91	95.9
17. *Threatened* to use a knife or a gun			0.79		0.64	0.77	1.6
16. Beat him/her up			0.74		0.62	0.82	3.8
2. Got information to back up your side of things				0.75	0.62	0.71	93.1
3. Brought in/tried to bring in someone				0.83	0.34	0.80	41.4
Eigenvalue:	5.73	1.92	11.9	1.05			
Percentage variance:	33.7	11.3	7.0	6.2			

Table IV. Root Mean Square (RMS) Coefficients of Factor Similarity

Aggression	Time 1 vs 2	Time 2 vs 3	Time 1 vs 3	Sex	Site 1 vs 2	Income High/Low	Education High/Low
Psychological	0.01	0.03	0.02	0.03	0.04	0.04	0.03
Physical	0.02	0.03	0.03	0.05	0.03	0.04	0.03

sites on the latter two variables), and length of the marriage (i.e., premarriage, and 6 and 18 months post marriage). Factor analyses were computed across these dimensions, and the comparability of the factor structure assessed[5]. As can be seen from Table IV, the RMS coefficients suggest high factor similarity across all comparisons computed (M RMS = 0.03, range: 0.01-0.05).

DISCUSSION

Substantial similarity in the nature of the two interpretable factors (viz. Physical Aggression and Psychological Aggression) emerged across all analyses in both studies. First, a global Physical Aggression factor emerged in all the factor analyses, with only two inconsistencies. Although item 10 typically loaded on the Physical Aggression factor, replicating previous results (Straus, 1979; Schumm *et al.*, 1982), this item also loaded on the Psychological Aggression factor for wives in the clinic sample. More importantly, items 16 and 17 loaded on the Physical Aggression factor in the clinic sample, but not in the nonclinic sample of beginning marriages. This may be a statistical artifact. The self-report of engaging in either of these two behaviors within the nonclinic sample was low (see Table III). On the contrary, both the "less severe" and "more severe" aggressive behaviors occurred far more frequently in the clinic sample (see Tables I and II). It is suggested that the failure of items 16 and 17 to load on the Physical Aggression factor in the nonclinic sample may be due to the infrequency with which they are endorsed (see Table III) (Comrey, 1978). In situations (e.g., such as a sample seeking marital therapy) where there are sufficient endorsements of these two behaviors, and hence adequate variability, these two factors do load on the Physical Aggression factor.

The present results have considerable implications for the assessment of physical aggression in future studies. It is suggested that the most par-

[5]Copies of all the factor analyses are available from the first author.

simonious physical aggression index would be based on CTS items 11-17. Even though items 9 and 10 usually load on this Physical Aggression factor in this and other factor analyses (Schumm *et al.,* 1982; Straus, 1979), there are a number of reasons justifying their exclusion. *First,* neither of these two items incorporates *physical* aggression directed against a partner. Rather, they assess either the throwing of an object in a non-person-directed manner, or a *threat* to hit the partner. Just because items 9 and 10 load together on the Physical Aggression factor does not necessarily mean that they measure physically aggressive behaviors. Individuals engaging in the behaviors represented by items 9 and 10 are likely to engage in physical aggression, but by themselves, items 9 and 10 do not measure physical aggression. *Second,* incorporating these items into a physical aggression index at this stage would mean that comparisons of current results based on the CTS with those of past research would be seriously compromised. For example, in the nonclinic sample, the prevalence of physical aggression is far higher when estimates are derived from items 9-17 (68%) rather than from items 11-17 (53%). *Third* research findings suggest that items 9 and 10 are not perceived to differ on severity or outcome from the Psychological Aggression items (i.e., items 4-8), but are perceived as less severe than items 11-17 that make up the Physical Aggression Index.

Although items 16 and 17 did not load on the Physical Aggression factor for the nonclinic sample, it is still suggested that they be included in the global Physical Aggression index. *First,* as mentioned previously, it is likely that their non-loading on the Physical Aggression factor was a statistical artifact of their low base rate in nonclinic populations. *Second,* their low base rate in nonclinic groups (less than 1% in the second study) would mean that a separate "Life Threatening Behavior" index would be extremely skewed: Summating items 16 and 17 to produce an index of "Life Threatening Behavior" in nonclinic samples would result in an extremely skewed distribution and truncated range, which might preclude the possibility of uncovering any statistically significant results. *Third,* in the same way that item 9 was excluded from the Physical Aggression factor as it contains only the *threat* of physical aggression, item 17 only contains the *threat* of the use of a knife or a gun, and hence in itself, is not life threatening. *Finally,* if a separate "Life Threatening Behavior" factor is not constructed, excluding items 16 and 17 from the general physical aggression index would mean that the occurrence of these two behaviors, which are perceived as more severe yet occur less frequently than items 11-15, would be totally ignored.

The final factor justifying the use of items 11-17 as the Physical Aggression index is its' extremely high correlation in the nonclinic sample with

an index that excludes items 16 and 17 (i.e., items 11-15; $r = 0.997$). The same situation prevails for both husbands (r's: 0.97 and 0.99, respectively) and wives (r's 0.97 and 0.98, respectively) in the sample of couples seeking marital therapy.

As already suggested, the use of averaged scores (e.g., husbands' self-reports of aggression and wives' reports of their husbands' aggression, and vice versa) overcomes to some extent the problem of moderate agreement between spouses' reports on marital aggression (Browning and Dutton, 1986; Jouriles and O'Leary, 1985; Szinovacz, 1983), and provides a more reliable method of scoring the CTS (Horowitz *et al.,* 1979; Strahan, 1980). The benefits of scoring each item on a trichotomous scale were also presented.

A remaining issue regarding the scoring of the CTS is the weighting of the items on the Physical Aggression factor. Items 11-17 are weighted equally, even though the frequency with which each behavior occurs is negatively associated with its perceived severity. To overcome this problem, it is suggested that standardized item scores be used to create a Physcial Aggression index. More severe behaviors that occur less frequently would receive a greater weighting than the less severe items that occur more frequently. This index would be easier to calculate in clinic situations than other, more complicated measures such as Hudson and McIntosh's (1981) 30-item Index of Spouse Abuse. It should be noted, however, that the use of standardized item scores results in a sample-specific variable, and caution must be exercised in comparing results across different samples (e.g., community and aggressive groups).

Although a Life Threatening Behavior factor emerged in Hornung *et al.*'s (1981) analysis, no such factor emerged in any of the analyses in either of the studies. A number of reasons might explain the discrepancies between Hornung *et al.'s* (1981) findings and those of the present study. *First,* as noted previously, items 16 and 17 exhibited very little variance due to their infrequent occurrence. If the few subjects endorsing one of the life threatening behaviors also endorse the other two, a homogeneous factor would emerge (see Comrey, 1978). Given the amount of information relevant to the factor analysis not contained in the Hornung *et al.* (1981) report, the possibility that this accounts for their Life Threatening Behavior factor cannot be excluded.

Second, only two of the items in the 17-item scale assess what might be regarded as life-threatening behavior, and one of those items (item 17) does not truly represent a physical threat. A scale should include approximately equal numbers of items predicted to load across different factors (Comrey, 1978), and so it is not surprising that life threatening behavior does not emerge consistently as a separate factor. (The same argument could account for the nonemergence of a separate Rational Problem Solving factor

throughout all the analyses in both studies.) It may be necessary, therefore, to expand the CTS to include a wider range of potentially life threatening behaviors (e.g., choking, burning, assault with a deadly weapon).

The Psychological Aggression factor emerged consistently in all analyses, even though Straus (1979) notes that the items that comprise this index were initially intended only to allow respondents to become acquainted with the nature and structure of the CTS items. For the factor analytic results obtained with the CTS to be meaningful, the Psychological and Physical Aggression factors should correlate differentially with other relevant relationship variables (Briggs and Cheek, 1986), and future research should assess whether this requirement is fulfilled. In any further research, the factor structure of the CTS among maritally aggressive samples might be investigated, as the base rate of relationship aggression is most likely greater in such samples. Nonetheless, it is suggested that if the above recommendations are followed for the assessment of physical aggression in the relationship, a more reliable and valid index would be available.

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