

Finding & Explaining Typologies of Violent Families

Professor Charles Cappell
Director & Founder, Sociology Quantitative Research
Laboratory, Northern Illinois University

Jeff Long
A.C. Nielsen

July 13, 2005

Paper presented at the 9th International Family Violence Research Conference, University of New Hampshire, Portsmouth NH. July 10-13. A copy of this paper can be found at Prof. Cappell's website: <http://www.socqrl.niu.edu/cappell>. Address all communication to ccappell@niu.edu.

Finding & Explaining Typologies of Violent Families

Last updated July 9, 2005

Introduction

This methodological paper describes the categorical latent class modeling techniques used to classify families with respect to different patterns of violence among members thereby enhancing our understanding of the relational aspects of family violence. Cappell (2002) gives an overview of the network/relational approach to family violence that can be operationalized using latent class techniques.

There has been a long interest in the “web of violence” or “cycle of violence” that these techniques can address directly (e.g. Renvoize, 1978; Pagelow, 1981). More recently, researchers have sought to integrate theory linking the comorbidity of partner and child violence, two dyadic relations (Slep and O’Leary, 2001).

These network/relational models require information on the incidence of violence between pairs of family members. Ironically, the best information of this sort is contained in the original 1976 National Family Violence Survey (Straus, Gelles, and Steinmetz, 1980). In this paper, we extend the latent class approach developed in Cappell (2002, 2005/1996) by introducing the level of husband and wife’s alcohol abuse as explanations for the formation of different types of violent families. While some use of latent class models has begun to appear in the epidemiological literature, it has been limited to the scaling context, e.g. determining classes of anxiety/depression (Kessler, Stein, & Berglund, 1998), and in the classificatory context, limited to testing for a typology of male batterers (Delsol, C. G. Margolin, & R. John, 2003).

We use the network explication of family violence and the latent class approach by analyzing two additional surveys of families even though there is less relational information available: The 1985 Family Violence Resurvey & the 1986 National Family & Household Survey (NFHS). Because of the lack of comparable survey formats, no explicit tests of the consistency of the latent typologies of family violence across surveys are possible. But the results suggest that violent families come in at least 3 or 4 types. Results suggests that different explanatory mechanisms & theories may be needed to explain the different forms of family violence. The 1986 NFHS collected only partial information about all potential violent relationships but has the virtue of containing information from both male and female partners. In a subsequent paper, we use the idea of simultaneous latent class analysis to assess intra-partner agreement.

Relational Models of Family Violence

The network based models of family violence developed in earlier work (Cappell, 2002, 2005/1996) is extended in this paper to include covariates measuring the degree of alcohol abuse of husbands and wives. To illustrate this extension, we use the same data, the NFVS76 and introduce the level of alcohol abuse reported for both the husband and wife.

The earlier work using this approach (Cappell, 2002) included tests for models with different numbers of latent classes; the final, best fitting model specified 4 classes. In that earlier analysis, certain restrictions were specified as well when some of the conditional probabilities equaled their boundary limits at 0 or 1.0. Below, the four class model is re-estimated using a different algorithm and no restrictions are placed on the estimates.

In the latent models considered in this section, there are five manifest variables that were created by counting the prevalence of violence that had ever taken place between family members and dichotomizing: (C to C) (C to P) (P to C) (H to W) (W to H). Only families with 2 or more children were used in this analysis. A referent child was selected and information about the relationships with that child, as well as violence between children, were solicited.

A basic latent class model hypothesizes a latent categorical variable that can explain the observed relationship between observed manifest categorical variables. The original latent class

modeling approach developed by Goodman (1974a) and Clogg (1981) has been extended (Vermunt, 1997) so that now one is able to estimate all of the types of latent structure models that were first developed for continuous, normally distributed variables (Joreskog, 1978).

The equations for a latent class model can be specified in the frequencies as a type of log-linear model or in the probabilities.

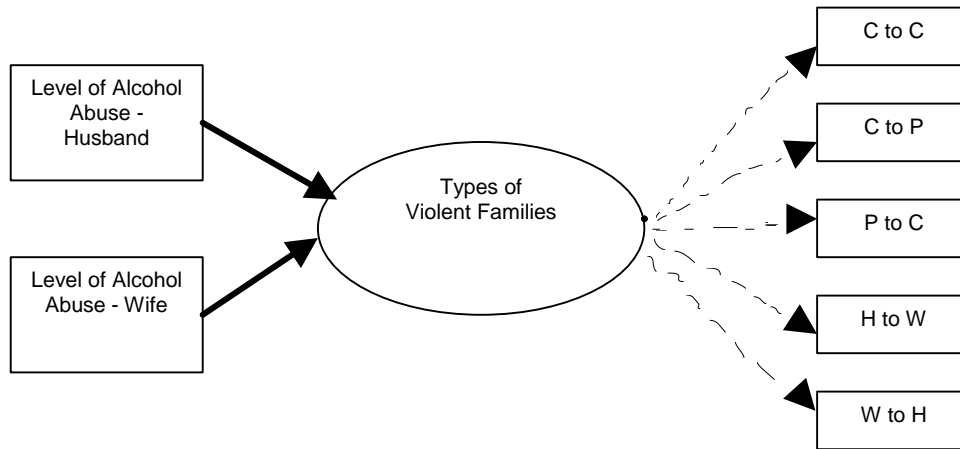
A latent class model proposes that once the value (or category, x_i) of the latent class variable (X) is specified, the joint probability of the manifest variables can be accurately estimated from the following type of equation:

$$P(XABCDE) = P(X) * P(A) * P(B) * P(C) * P(D) * P(E) * P(A|X) * P(B|X) * P(C|X) * P(D|X) * P(E|X) \quad \text{Eq. 1}$$

One can include covariates in the model as well.

$$P(XYZABCDE) = P(X) * P(A) * P(B) * P(C) * P(D) * P(E) * P(X|Y) * P(X|Z) * P(A|X) * P(B|X) * P(C|X) * P(D|X) * P(E|X) \quad \text{Eq. 2}$$

A conceptual path model for the hypothesized model estimated in this section looks identical to those created for structural equation models, except all the variables are ordinal or nominal:



The dotted arrows symbolize a measurement relation, that the prevalence of various types of violence between pairs of family actors are indicators of certain types of families. The solid arrows represent explanatory relationships, that the type of family is a function of the level of alcohol abuse by husbands and wives.

Finding the Latent Classes using the Indicators of Relational Violence

The measurement portion of the model can be identified by interpreting the conditional probabilities of observing a particular dyadic violent relationship given membership in a particular latent class, after, of course, one has properly determined the number of latent classes and the goodness of fit of the model. This four class model is the best fitting model.

Below are the estimated conditional probabilities of observing a level of the manifest variable (violence absent or present) given membership in a latent class from the analysis specifying 4 latent classes (Table 1). These estimates of conditional probabilities are useful in interpreting the meaning of the latent classes (See Cappell, 2002 for a more complete discussion of these and related results) and produce a profile of the latent classes (Vermunt and Magidson, 2000).

Table 1: Pattern of Estimated Violence Conditioned on Latent Class Membership –NFVS, 1976

Final Conditional Probabilities: (active covariate estimates in parenthesis)					
Relationship	Incidence of Violence	Latent Classes of Family Violence			
		Discipline Focused	Sibling Focused	Mutual Combat	Hierarchical/ Power-Dependence
C to C	No Violence	.085 (.085)	.573 (.572)	.003 (.008)	.280 (.295)
	Violence	.915 (.915)	.427 (.428)	.997 (.992)	.720 (.705)
C to P	No Violence	.732 (.733)	.990 (.994)	.465 (.485)	.928 (.912)
	Violence	.268 (.267)	.010 (.006)	.535 (.515)	.072 (.088)
P to C	No Violence	.090 (.090)	.813 (.818)	.008 (.005)	.586 (.561)
	Violence	.910 (.910)	.187 (.182)	.992 (.995)	.414 (.439)
H to W	No Violence	.956 (.994)	.999 (.999)	.274 (.219)	.219 (.270)
	Violence	.044 (.006)	.001 (.001)	.726 (.781)	.781 (.730)
W to H	No Violence	.999 (.987)	.989 (.999)	.135 (.307)	.457 (.487)
	Violence	.001 (.013)	.011 (.001)	.865 (.693)	.543 (.513)
Cluster Size in Population		.524 (.507)	.318 (.313)	.091 (.101)	.066 (.078)

These results can be interpreted to reflect the probability of having ever observed a particular violent relationship given membership in a certain latent class, a type of violent family.

For example, if we were able to observe the course of the family's interactions within a Mutual Combat type family, we would witness husband-to-wife violence with probability of .726 and wife-to-husband violence with probability of .865. The estimates in parentheses are adjusted for the association the covariates (husband and wife alcohol abuse) have with the latent variable: type of family and thus will be somewhat different than the unadjusted estimates.

The conditional probabilities (inactive covariates) are charted in Figure 1, making the comparisons between types of families clearer to see.

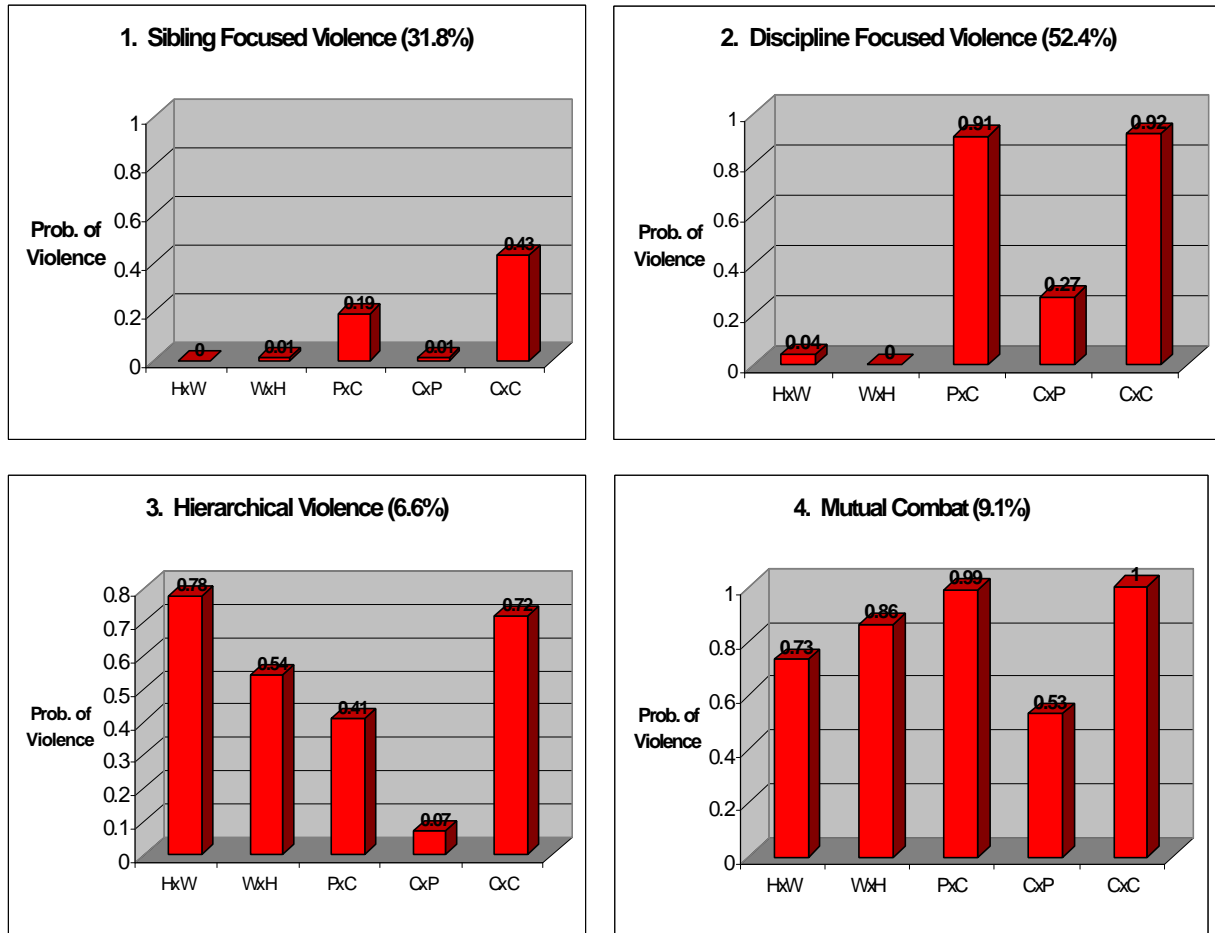


Figure 1: Latent Classes and Conditional Probabilities for Families with at least 2 Children, 1976 NFVS.

An alternative presentation of the results appears in Figure 2, a type of valued network graph, where the numerical value next to the arrow specifies the estimated probability of ever observing violence between the involved actors for a given latent class. In Figure 2, we contrast the Mutual Combat type of family (Figure 2a) to the Hierarchically Violent Family Figure 2b). If we had chosen to estimate separate models for males and females, we could have specified which parent was involved in the violent parent-to-child interaction, but here we have aggregated the data overlooking the sex of the respondent. In a separate paper, Cappell (1996) has investigated the comparability of the models estimated separately and simultaneously for makes and females; the basic structure of the aggregated results holds.

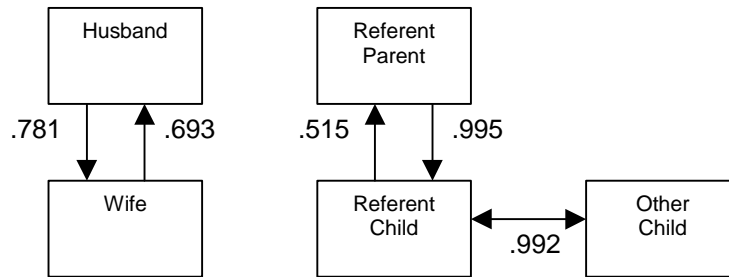


Figure 2a: Mutual Combat (9.7%) (At Least Two Children Families)

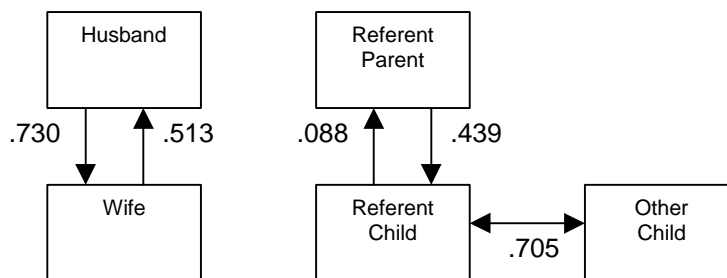


Figure 2b: Hierarchical (Patriarchal) Violence (7.8%) (At Least Two Children Families)

These two types differ primarily with respect to the much higher probability of child-to-parent violence in the Mutual Combat family than in the Hierarchical family and the higher probability of wife-to-husband violence in the Mutual Combat family than in the Hierarchical family.

The Effects of Husband and Wife Alcohol Abuse on Violent Family Typologies

With the two covariates introduced in the model, the levels of husband and wife's reported alcohol abuse, one can estimate the direct effect – or association – of covariates on the latent variable, the probabilities of the different types of violent families. These variables were measured originally on a 6 point scale, in this analysis the higher levels of reporting 'getting drunk': occasionally, often, very often, and almost always were combined into one category to aid interpretation (analysis on the original variable with 6 levels produced nearly identical results). The results are presented in Table 2.

Both the level of alcohol abuse of the wife and the husband had statistically significant effects on the probabilities of being in a particular type of violent family. Increased alcohol abuse has the effect for husbands to increase the probability of being in a Mutual Combat type family (0.539); for wives to increase the probability of being in an Hierarchical/Power type family (0.626).

It is tempting to interpret this estimated covariate effect as causative; but one must note that the data are cross-sectional, so alcohol abuse could be a response as well as a cause of or coincident with membership in a particular type of violent family. With this warning in mind, we will interpret how the probabilities of being in a latent class are affected as the level of alcohol abuse changes. There is practically no affect of alcohol abuse on the probability of being in a discipline focused violent family: the overall probability of the discipline focused violent family is estimated

to be .507 and the range of conditional estimates vary from .488 to .529 across the level of husband's alcohol abuse, and across the range from .452 to .559 for levels of the wife's alcohol abuse. The husband's alcohol abuse increases the chances of being in a Mutual Combat type family from .060 for those who never abuse alcohol to .232 for those with highest levels of abuse. The probability of being in a Hierarchical type violent family also increases for the category of alcohol abusers, from .063 for those with no reported abuse to .120 for those with the highest levels. Thus, we can summarize the effect of reporting the highest level of abuse to the lowest by computing the relative risk of these two categories on the chances of being in violent families: a factor of nearly 4 (3.8) for Mutual Combat families, and a factor of 2 for Hierarchically violent families. Note that in the Mutual Combat families, husbands are the targets of violence as well as the perpetrators. Thus, male alcohol abuse leads to more pervasive violence among family members.

Female alcohol abuse has a different effect: there is not much of an increase in the probability of being in a Mutual Combat type family, but the chances of being in a Hierarchical type violent family change from .059 for those who never abuse alcohol to .264 for the females with the highest level of alcohol abuse, a relative risk factor of 4. In these hierarchically violent families, wives do have a relatively high probability of violence directed at their husbands, .54, but a higher probability of being targeted by their husbands, .78.

This extension of latent class analysis reveals that the effects of alcohol abuse by males and females in larger families (at least two children), are not parallel. Alcohol abuse by females increases their chances of being in a Hierarchically organized violent family; alcohol abuse by males increases their chances of being in a Mutually violent family. A model that specified an interaction effect between male and female alcohol abuse on the probabilities of violent families did not reveal a substantial or statistically significant effect. The effects of alcohol abuse estimated here are additive, and produce different consequences for men and women.

Table 2: Alcohol Abuse Covariate Effects on Latent Class Membership

Estimated Conditional Probabilities of Latent Class Membership given level of Alcohol Abuse (est. with active covariates)				
Covariates	Latent Classes of Family Violence			
	Discipline Focused	Sibling Focused	Mutual Combat	Hierarchical/ Power-Dependence
Husband Alcohol Abuse				
1 - Never	.503	.375	.060	.063
2 - Rarely	.529	.284	.102	.084
3 - Occasionally +	.488	.160	.232	.120
Husband Alcohol Effect Wald Statistic, 18.96 p-value (<.001)	-0.120	-0.322	0.539	-0.98
Wife Alcohol Abuse				
1 - Never	.500	.351	.090	.059
2 - Rarely	.559	.179	.140	.122
3 - Occasionally +	.452	.124	.160	.264
Wife Alcohol Effect Wald Statistic, 9.19 p-value (.027)	.008	-.486	-.148	.626
Latent Class Probabilities	.507	.313	.101	.078

**Typologies of Violent Families in Subsequent Surveys:
National Family Violence Resurvey NFVRS-1985 &
National Family and Household Survey 1987**

In the NFVS (1976), Straus and his colleagues used the Conflict Tactics Scale (CTS) to assess the prevalence of escalated violence among family members. The CTS probes for increasingly violent interactions so that there is a better chance of recovering even minute forms of violence that took place. This measurement battery provides the most complete information on interpersonal violence and the most valid operationalization of inter-familial patterns of aggression.

The National Family Violence Resurvey (1985) expanded the sample size, retained the full Conflict Tactics Scale measurements for some relationships, but reduced and changed the type of questions asked about violence involving children. In the 1985 replication of this study, the CTS was not used for questions of child-to-child and child-to-parent violence (refer to Table 3), and this detail was lost. Instead, a survey question was employed that asked respondents to report whether their children had gotten into physical fights with other children at home.

Table 3: Comparison of Operational Definitions across Three Surveys

Relationship	National Family Violence Survey 1976	National Family Violence Survey 1985	National Family & Household Survey 1987
C to C	Full Set CTS Questions	Gotten into fights with other children at home	These questions are about behavior problems that many children have. As you read each behavior, decide if it is not true, sometimes true, or often true of this child's behavior over the past year. (1=Not true; 2=Sometimes true; 3=Often True; 9=Not Applicable) TROUBLE GETTING ALONG WITH OTHER CHILDREN
C to P	Full Set CTS Questions	Child gets in fight w/ adult at home	None asked
P to C	Full Set CTS Questions	Full Set CTS Questions	Listed below are several ways that parents interact with their children. Indicate how often you do each of the following. (1=Never; 2=Seldom; 3=Often; 4=Very Often; 6=Not Applicable) c. Spank or slap the child
H to W	Full Set CTS Questions	Full Set CTS Questions	There are various ways that married couples deal with serious disagreement. When you have a serious disagreement with your husband/wife, how often do you: (1=Never; 2=Sometimes; 3=Often; 4=Very Often; 5=Always; 6=Not Applicable) d. End up hitting or throwing things at each other
W to H	Full Set CTS Questions	Full Set CTS Questions	Identical questions as Husband to wife (asked each spouse about self & other – dual respondent measures)

The NFHS87 survey used a drastically reduced form of the Conflict Tactics Scale and no measure of child to parent violence. Table 3 compares the different operational definitions used in the three surveys.

It is quite possible that the dramatic decrease in reported violence between children is at least partially due to the increased measurement error associated with such truncated methods of measuring child-to-child and child-to-parent violence in the later surveys. These different measurement approaches make it impossible to directly test the stability of family violent typologies across samples.

These inconsistent measurements of family violence are undoubtedly implicated in the different levels of violence measured by the different surveys. (See tables 4 and 5 below.)

An inconsistent pattern of child-to-parent violence is apparent: in the NFVS (1976), 15.68% of males and 21.96% of females reported at least one instance of child oriented violence toward a parent. However, in the NFVR (1985) we see that these percentages drop to 0.41% and 1.11% respectively. No comparative question on child-to-parent violence was asked in 1987-88 of the NSFH.

Parent- to-child violence remains consistently high across survey year and instrument. Parents consistently use violence in conflict situations with children. Note, however, differences between males and females. In the NFVS (1976), 58.33% of males reported that they had perpetrated at least one violent act toward a referent child in the last year compared to 68.12% of females. In the NFVR (1985), a similar percentage of men reported using violence toward a child (58.19%), while the percentage of women reporting this type of violence decreased (63.81%). Importantly, the NSFH shows consistently high reports of violence toward children, but the differences between men and women and their reported use of violent behavior (75.03% for men, 71.33% for women) are not statistically significant ($\chi^2 = 3.9, p=.23$).

This pattern of results suggests that there may be something different about the relationship that each parent has with the child. However, the progression across survey years shows that the disparities in men's and women's reports of the use of violence toward their children have decreased substantially.

The final pair of violent interactions among family members (husband to wife and wife to husband) remain more consistent across year and instrument. Among male respondents in the NFVS (1976), 12.97% report perpetrating some form of physical violence on their spouse. In the NFVR (1985) and the NSFH (1987), this percentage dropped slightly to 11.56% and 8.94% respectively. Among female respondents in the NFVS (1976), 11.90% report having some form of violence perpetrated against them by their husband. In the NFVR (1985), this percentage increases slightly to 12.51%, while the NSFH (1987) reports a slightly lower percentage (9.88%). Interestingly, women report higher levels of husband to wife violence than men across all three. However, these results were not found to be statistically significant ($X^2 = 6.78, p=.12$). The lower level of reporting of spousal violence in the NSFH (1987) may be due in part to the lack of the context employed in earlier Family Violence surveys.

According to Table 4, in 1976, 11.63% of male respondents reported that their wife perpetrated some form of violent act against them in the previous year (NFVS). This percentage increased slightly in the NFVR (1985) to 12.96%, and was lower in the NSFH (1987) (9.57%). Female respondents consistently reported higher levels of wife to husband violence than did men (11.73%, 13.27%, and 10.01% respectively). However, these results were not found to be significantly different across gender or survey year ($\chi^2=4.45, P<.19$).

Table 4: Frequencies of Violence Incidence Across Three Surveys

Type of Violent Exchange	Incidence of Violence	Table of Descriptive Results					
		NFVS 1976		NFVR 1985		NSFH 1	
		Male	Female	Male	Female	Male	Female
C to C	Violence	70.52	79.07	4.43	5.36	29.17	27.89
C to P	Violence	15.68	21.96	0.41	1.11	--	--
P to C	Violence	58.33	68.12	58.19	63.81	75.03	71.33
H to W	Violence	12.97	11.90	11.56	12.51	8.94	9.88
W to H	Violence	11.63	11.73	12.96	13.27	9.57	10.01

**Numbers in cells represent the percent that report using that particular type of violence toward family members.

These comparisons reveal that uncovering the typologies of family violence is sensitive to the questions asked – if no question is asked about child-to-child or child-to-parent violence, it is obvious that this aspect cannot be captured. But a single question, posed in general context, is not likely to have the measurement validity that the dyadic focus of the Conflict Tactics Scale approach will have. When analyzing multi-dimensional joint distributions, cell frequencies in many cells will be very small. Thus, any measurement instrument biased in manner to suppress the violence measured can affect the results. The comparisons also suggest fairly consistent results when comparable measures, with high validity, are used. In spite of these limitations arising from the less than complete measurement of all forms of violent family interactions used in the last two surveys compared, we will apply latent class analysis to the joint occurrence of violent family interactions measured in both surveys.

Uncovering Typologies of Family Violence in the NFVRS 1985

The results from the latent class analysis of the NFVRS (1985) families with children are presented in Table 5. Perhaps because of the inferior measures of child-to-child and child-to-parent violence, a slightly different typology results, a three class rather than a four class model. However, the typology shows some consistencies with that uncovered from the first NFVS.

Table 5. Pattern of Estimated Violence Conditioned on Latent Class Membership-(NFVRS 1985)

Final Conditional Probabilities (1985)				
Relationship	Incidence of Violence	Latent Classes of Family Violence		
		Disciplined Focused	Hierarchical (R to C) Mutual Combat (H to W)	Sibling Focused
C to C Aggression	No Violence	.97	.92	.56
	Violence	.03	.08	.43
C to R Aggression	No violence	.97	.98	.96
	Violence	.03	.01	.04
R to C Aggression	No Violence	.42	.14	.04
	Violence	.58	.85	.96
H to W Aggression	No Violence	.98	.19	.99
	Violence	.02	.81	.01
W to H Aggression	No Violence	.95	.29	.97
	Violence	.05	.71	.03
Overall Cluster Size in Population		.73	.18	.09

The 18% of American families classified as a combination of Hierarchical and Mutual appears to be a combination of the two separate types uncovered from the earlier survey with more complete measures. The absence of a better indicator of violence involving children masks the possibility of confirming the earlier structure where the Mutual Combat type emerged as a distinct category comprised of 9% of the American families with children.

National Family and Household Survey, 1986

One of the manifest indicators of family violence, C to R, was not measured in this survey, so the latent structure analysis is based on only four variables. But in the previous model, the probabilities of C to R changed very little across the different types, ranging from .01 to .04, having little impact on the distribution of the underlying latent family violence variable.

A very similar typology emerges from our analysis of the NFHS (1986).

Table 4. Conditional Probabilities of Specific Aggressive Relations (NSFH Wave 1)

Final Conditional Probabilities (NSFH Wave 1)				
Relationship	Incidence of Violence	Latent Classes of Family Violence		
		Disciplined Focused	Sibling Focused	Hierarchical (R to C) Mutual Combat (H to W)
C to C Aggression	No Violence	.63	.13	.69
	Violence	.37	.87	.31
R to C Aggression	No Violence	.05	.48	.38
	Violence	.95	.52	.62
H to W Aggression	No Violence	.99	.99	.06
	Violence	.01	.01	.94
W to H Aggression	No Violence	.98	.99	.12
	Violence	.02	.01	.88
Overall Cluster Size in Population		.49	.41	.09

The same basic structure of different types of violent families emerges in this analysis. The Mutual Combat-Hierarchical type is estimated to account for 9% of the American families with children, half the estimate from the NFVRS (1985), but paralleling the 9% of families identified as the Mutual Combat type estimated from the original NFVS (1976). The other two types, which are mostly generated by levels of child violence, are consistent across the different surveys, although their proportion in the population of families changes.

Conclusions and Discussion

The analyses presented above demonstrate that a network/relational approach to family violence, where the family is the unit of analysis, combined with latent structure class analysis can rigorously test models describing and explaining the formation of violent families. The approach is only limited by the inadequacy of most existing survey based data that, of course, were not generated with the network approach in mind.

With less than perfect data in hand, it is still possible to learn something new from these older studies. Families can be categorized according to the different probabilities of specific dyadic violent relations. Three or four different types of families seem to exist among those with at least two children. Nearly all families have substantial probabilities of sibling violence, and well over half have a high probability of parent-to-child violence. Violence involving husbands and wives comes in possibly two versions, Mutual Combat, where all family members are perpetrators as well as victims, and one where there is a more hierarchical pattern to the violence led by husband-to-wife violence.

The role of alcohol abuse for men and women has differential effects on the type of family of which one is a member: increasing the chances that a male is associated with a Mutual Combat family and that a female is associated with a Hierarchically Violent family.

our analysis has moved us away from an isolated focus on perpetration or victimization and

outlined an approach that can be used to study family violence in its full network, embedded sense.

Perhaps some of the heated debates in the area of family violence have been generated by different researchers or advocates basing their generalizations on one rather than another particular form of violent family.

We encourage the development of more surveys that approach the high quality of network based measurements needed for the types of analysis outlined here. Quality measures of each type of dyadic relationship and the degree of violence present in all of those relationships can give a better understanding of the different “webs of violence” too many families weave.

References

- Berk, Richard A., Sarah Fenstermaker Berk, Donileen R. Loseke, and David Rauma. 1983. "Mutual Combat and Other Family Violence Myths." Pp 197-212 in *The Dark Side of Families. Current Family Violence Research*, edited by David Finkelhor, Richard J. Gelles, Gerald T. Hotaling, and Murray A. Straus. Thousand Oaks, CA: Sage Publications, Inc.
- Brush, Lisa D. 1990. "Violent Acts and Injurious Outcomes in Married Couples: Methodological Issues in the National Survey of Families and Households." *Gender and Society* 4(1):56-67.
- Cappell, Charles. 1996. "Patterns of Violence within U.S. Families: A Simultaneous Group Latent Structure Analysis of Violent Family Interactions." Paper Presented at the Conference on Social Science and Statistics: In Honor of the Late Clifford C. Clogg. Sept. 26-28, 1996, Pennsylvania State University.
- . "Latent Models of Violent Family Comorbidity." Paper presented at the annual meeting of the Midwest Sociology Society, Milwaukee WI, April 4, 2002
- Cappell, Charles, and R. Heiner. 1990. "The Intergenerational Transmission of Family Aggression." *Journal of Family Violence* 5:135-152
- . 1993. "Intergenerational Transmission of Spousal Aggression: Gender-Linked Perpetration, Vulnerability, and Co-Morbidity." Paper presented at the annual meeting of the American Sociological Society, August 24, 1992.
- Clogg, Clifford C. 1981. "New Developments in Latent Structure Analysis" Pp 215-246 in *Factor Analysis and Measurement in Sociological Research*, edited by David J. Jackson and Edgar F. Borgotta. Beverly Hills, CA: Sage Publications, Inc.
- . 1988. "Latent Class Models for Measurement" Pp 173-205 in *Latent Trait and Latent Class Models*, edited by Rolf Langeheine and Jurgen Rost. New York, NY: Plenum Press.
- DeMaris, Alfred, Michael L. Benson, Greer L. Fox, Terrence Hill, and Judy Van Wyk. 2003. "Distal and Proximal Factors in Domestic Violence: A Test of an Integrated Model." *Journal of Marriage and Family* 65:652-667.
- Dayton, Mitchell C. and George B. Macready. 1988. "A Latent Class Covariate Model with Applications to Criterion-Referenced Testing" Pp129-143 in *Latent Trait and Latent Class Models*, edited by Rolf Langeheine and Jurgen Rost. New York, NY: Plenum Press.
- Delsol, Catherine, Gayla Margolin, and Richard S. John. 2003. "A Typology of Maritally Violent Men and Correlates of Violence in a Community Sample." *Journal of Marriage and the Family* 65:635-651.
- Felson, Richard B. and James T. Tedeschi. 1993a. "A Social Interactionist Approach to Violence: Cross Cultural Applications." *Violence and Victims* 8(3): 295-310.
- . 1993b. *Aggression and Violence: Social Interactionist Perspective*. Washington, D.C.: American Psychological Association.
- Finkelhor, David, Richard J. Gelles, Gerald T. Hotaling, and Murray A. Straus. 1989. *The Dark Side of Families: Current Family Violence Research*. Thousand Oaks, CA: Sage Publications, Inc.
- Goodman, Leo A. 1974a. "The analysis of systems of qualitative variables when some of the variables are unobservable. Part I – a modified latent structure approach. *American Journal of Sociology* 79:1197-1259.
- Goodman, Leo A. 1974b. "Exploratory Latent Structure Analysis Using both Identifiable and Unidentifiable Models." *Biometrika* 61:215-231.
- Hagenars, Jacques, and Allan McCutcheon (Eds.). 2002. *Applied Latent Class Analysis*. Cambridge, UK: Cambridge University Press.
- Johnson, Michael P. 1995. "Patriarchal terrorism and common couple violence: Two forms of violence against women." *Journal of Marriage and Family* 57:283-94.
- Joreskog, K.G. 1978. "Structural analysis of covariance and correlation matrices." *Psychometrika* 43:443-477.
- Kessler, Ronald C; Stein, Murray B; Berglund, Patricia. 1998. "Social phobia subtypes in the National Comorbidity Survey." *American Journal of Psychiatry*. 155:613-619.
- Luckenbill, David F. 1977. "Criminal Homicide as a Situational Transaction." *Social Problems*

- 25:176-186.
- Magidson, Jay, and Jeroen K. Vermunt. 2001. "Latent class factor and cluster models, bi-plots, and related graphical displays. PP. 223-264 in Michael E. Sobel and Mark P. Becker (Eds.). *Sociological Methodology 2001*. Oxford: Blackwell.
- Markowitz, Fred M. 2001. "Attitudes and Family Violence: Linking Cultural and Intergenerational Theories." *Journal of Family Violence* 16(2):205-218.
- McCutcheon, A. 1990. *Latent Class Analysis*. Sage University Paper Series on Quantitative Application in the Social Sciences. Beverly Hills, CA: Sage.
- Pagelow, M. (1981). "Factors affecting women's decisions to leave violent relationships." *Journal of Family Issues* 2:391-414.
- Parker, Robert N. and Kathleen Auerhahn. 1998. "Alcohol, Drugs, and Violence." *Annual Review of Sociology* 24:291-311
- Reiss, AJ Jr., and J.A. Roth, eds. 1993. *Understanding and Preventing Violence*. Vols. 1-4. Washington, D.C.: National Academic Press.
- Renvoize, J. 1978. *Web of Violence: A Study of Family Violence*. London: Routledge & Kegan Paul.
- Slep, Amy M. Smit, and Susan G. O'Leary. 2001. "Examining partner and child abuse: Are we ready for a more integrated approach to family violence?" *Clinical Child and Family Psychology Review* 4:87-107.
- Straus, Murray, Richard Gelles, and Suzanne Steinmetz. 1980. *Behind Closed Doors*. New York: Anchor Books.
- Swinford, Steven P., Demaris, Alfred, Cernkovich, Stephen, Giordano, Peggy. 2000. *Journal of Marriage and the Family* 62(2):508-519.
- Vermunt, Jeroen. 1997. *Lem: A General Program for the Analysis of Categorical Data*. Tilburg, University.
- Vermunt, Jeroen, and Jay Magidson. 2000. *Latent Gold: User's Guide*. Belmont, MA: Statistical Innovations.