

1966

## Measurement of Delinquency in Montreal

Andre' Normandeau

Follow this and additional works at: <https://scholarlycommons.law.northwestern.edu/jclc>

 Part of the [Criminal Law Commons](#), [Criminology Commons](#), and the [Criminology and Criminal Justice Commons](#)

---

### Recommended Citation

Andre' Normandeau, Measurement of Delinquency in Montreal, 57 J. Crim. L. Criminology & Police Sci. 172 (1966)

This Criminology is brought to you for free and open access by Northwestern University School of Law Scholarly Commons. It has been accepted for inclusion in Journal of Criminal Law and Criminology by an authorized editor of Northwestern University School of Law Scholarly Commons.

## THE MEASUREMENT OF DELINQUENCY IN MONTREAL

ANDRÉ NORMANDEAU\*

This study is a partial replication of the extensive research by Sellin and Wolfgang<sup>1</sup> on constructing a sensitive index of delinquency (and crime). Their research has led them to devise a new and more adequate method for measuring delinquency, a method that takes into account the frequency, complexity and the degree of gravity of offensive events in which juveniles participate. *The differential weighting of the seriousness of offenses* is one of the main features of the research. This aim was obtained when "numerical" judgments were elicited from theoretically meaningful and large social groups in Philadelphia. The present paper compares the numerical judgments of a group of French Canadians, in Montreal, Canada, with judgments of a group in Philadelphia.<sup>2</sup>

The underlying theory used by Sellin and Wolfgang for the scaling of delinquency events is based upon work in psychophysics. The authors looked especially to S. S. Stevens' ideas and studies about objective methods of measurement which have been developed into psychological "laws" relating two different kinds of psychological scales.<sup>3</sup> These methods have been applied by Sellin and Wolfgang to such nonphysical dimensions as the graded seriousness of deviant behavior. Following many psychophysicists, the authors justify a preference for the magnitude scale relative to the category scale on the basis of the meaning that can be assigned to the average scale values of either of them. The heart of their point is that the magnitude estimation scale values are a product of the rater rather than the experimenter, and as such have an

inherent validity that cannot be claimed for the imposition of a fixed range of category values by the experimenter on the rater's judgment.

The scale scores were derived by having nearly 800 policemen, university students in Philadelphia, and juvenile court judges in Pennsylvania rate 141 different events. The term "event" refers to a configuration of objectively observable and describable elements of the law violation. The most strongly supported conclusion arrived at by the authors on the basis of the data at hand was that all the raters tended to so assign the magnitude estimations that the seriousness of the crimes was evaluated in a similar way, without significant differences, by all the groups. Given information about the age of the offender did not particularly color a person's judgment about the seriousness of the offense. A pervasive social agreement about what was serious and what was not appeared to emerge, and this agreement transcended simple qualitative concordance; it extended to the estimated numerical degree of seriousness of these offenses. Moreover, an item analysis was made, based principally upon the criterion of inconsistency ratings, in order to eliminate some subsidiary variables which had been thought important but were not considered so by the raters. There remained a residual score of offenses and their concomitant variables which were theoretically<sup>4</sup> and empirically significant and which also had seriousness scores of sufficient discrimination to warrant their use.

It was, however, necessary to run a retest of these residual items in order to increase points of reference for money values. This final stage was set up using 105 students from the University of Pennsylvania (U of P). Fifteen residual but essential offense versions were presented for their judgment. Their evaluation, for parallel versions, was also similar to the estimation of the previous groups

\*The author is presently a doctoral candidate in sociology, specializing in criminology at the University of Pennsylvania, and has been a contributor to French and Canadian professional journals. Along with D. D. Akman, Mr. Normandeau last year received a grant from the Canada Council that allowed them to replicate partially across Canada the scaling analysis in the Sellin-Wolfgang Index. This replication is in progress and will be published next year.

<sup>1</sup>SELLIN & WOLFGANG, *THE MEASUREMENT OF DELINQUENCY* (1964).

<sup>2</sup>We wish to thank Drs. T. Sellin and M. E. Wolfgang of the Center of Criminological Research at the University of Pennsylvania, and Professor S. Turner of the Sociology Department at Temple University, for their advice and critical comments.

<sup>3</sup>See especially S. Stevens, *On the Psychological Law*, 64 *PSYCHOL. REV.* 153 (1957).

<sup>4</sup>It must be pointed out that for strong theoretical reasons, explained in detail in the book, only offenses that cause some harm to persons directly (in bodily, loss or damage of property) were looked upon as appropriate for the proposed index. Subsidiary variables kept or eliminated were thus variables related to offenses of that type.

of raters. The final index was thus derived only from U of P's scores.

Our own study in Montreal replicates this final stage. Our replication model may be called "a minimal model" for it assumes the validity and reliability of the basic procedures up to that final stage on the ground of the strong and continuous demonstration by Sellin and Wolfgang of the logical, theoretical and empirical self-explanatory power of each previous step of their research.

#### RATIONALE FOR THE REPLICATION

There is no doubt that Sellin and Wolfgang's results must be tested—for the time being, in "space"—if we want to generalize such results to other parts of the United States or other societies in order to possess a desirable but also reliable common rod in addition to the more sensitive quality of the index per se.

Sellin and Wolfgang are well aware of this feature. Their hypothesis about the results of replications in different places states that the profile of seriousness of offenses should be expected to be similar in all Western societies, and, obviously, for the United States in general. As they put it:

Over time and in quite different cultures differences might occur; we are not suggesting that our final scale values or offense scores contain definitive features. But the offense items or delinquency events which we have scored are limited in number and character and represent fairly universal prescriptions and prohibitions in Western culture so that we would not be surprised to find a high degree of consistent, stable response over a wider range of subjects than was employed in this analysis.<sup>5</sup>

and elsewhere:

We suspect that the effort to maximize efficiency and minimize components for weighting has produced an index which might be applicable to a wide band of general cultural variants, but only further research can determine the correctness of this assumption. . . The important consideration . . . is that the theory of measurement, of scaling, and of index construction should contain universal application. The preservation of ratio in scale values, the choice of additive factors in the index, and the extent to which the instant scale values and scoring system can be used

<sup>5</sup> SELLIN & WOLFGANG, *op. cit. supra* 322-323.

as a standard are presented as partially tested or *testable hypotheses*.<sup>6</sup>

Their hypothesis of uniformity in attitude throughout "a wide band of cultural variants" must be tested. Our study is one partial test.

#### PROCEDURE

Fifteen versions, similar to the offenses selected by Sellin and Wolfgang and rated by U of P students, were chosen for the replication.<sup>7</sup> This range covers every criminal event that falls into the new system developed by Sellin and Wolfgang.

The sample consisted of male and female students enrolled in the course of introductory sociology at the University of Montreal (U of M). Of the 250 subjects, 18 were discarded because they were not French Canadians. Of the remaining 232 subjects, 177 were males and 55 were females. At the U of P, all 105 subjects were males.<sup>8</sup>

<sup>6</sup> SELLIN & WOLFGANG, *op. cit. supra* 332-333.

<sup>7</sup> The fifteen offense versions were:

- A. *Without breaking into or entering* a building and with no one else present, an offender takes property worth \$5.
- B. *Without breaking into or entering* a building and with no one else present, an offender takes property worth \$20.
- C. *Without breaking into or entering* a building and with no one else present, an offender takes property worth \$50.
- D. *Without breaking into or entering* a building and with no one else present, an offender takes property worth \$1,000.
- E. *Without breaking into or entering* a building and with no one else present, an offender takes property worth \$5,000.
- F. An offender *breaks into* a building and with no one else present takes property worth \$5.
- G. An offender *without a weapon* threatens to harm a victim unless the victim gives him money. The offender takes the victim's money (\$5.) and leaves without harming the victim.
- H. An offender *with a weapon* threatens to harm a victim unless the victim gives him money. The offender takes the victim's money (\$5.) and leaves without harming the victim.
- I. An offender inflicts injury on a victim. The victim dies from the injury.
- J. An offender inflicts injury on a victim. The victim is treated by a physician *and* his injuries require him to be hospitalized.
- K. An offender inflicts injury on a victim. The victim is treated by a physician *but* his injuries do not require him to be hospitalized.
- L1. An offender shoves (or pushes) a victim. The victim does not require any medical treatment.
- L2. An offender beats a person with his fists. The victim is hurt but requires *no* medical treatment.
- M. An offender forces a female to submit to sexual intercourse. No other physical injury is inflicted.
- N. An offender takes an automobile which is recovered undamaged.

<sup>8</sup> The theoretical reason for the choice of students is well stated by Sellin and Wolfgang. (*op. cit.*, p. 249-

## HYPOTHESES

Hypotheses for the Canadian study follow the assertion of Sellin and Wolfgang about uniform universal prescripts and prohibitions in Western cultures and uniform patterns of responses to them:

- (1) That a constant comparable percentage of increase in the weighted seriousness of the judge violations of law will relate the magnitude estimation scale scores of Pennsylvania and Montreal (inter-culturally), and of Montreal males and Montreal females (intra-culturally).
- (2) That moreover, the multiplicative power (or rate) of the constant increase in seriousness will be similar in Philadelphia and in Montreal: that is, the ratios of offense seriousness will be preserved intact across cultures (Philadelphia versus Montreal) and across sexes, or intra-culturally (Montreal males versus Montreal females).

## ANALYSIS OF THE RESULTS

Each offense in our study was judged by all subjects. To summarize these results each offense was described by its *average* score, or geometric mean. The geometric mean is frequently used to average ratios, and because we have assumed that we have a ratio scale, the geometric mean is appropriate. Furthermore, in situations like the present one, the geometric mean is probably more stable than other sorts of averages.<sup>9</sup> Thus, refer-

250): "The philosophy and the sociology of the criminal law suggest that principal culture themes of legal prescriptions and sanctions come from the middle-class value system. Representatives of this value system legislate and adjudicate. Thus the definition of crime and the administration of criminal justice are institutionalized expressions of the normative structure of the dominant middle class in American society . . . Despite their occasional revolt against authority while part of the teen-age culture, university students like their parents, generally hold the middle-class values embodied in the common law. Avoidance of physical aggression in the form of assaultive behavior, a quasi-sacred respect for property, the importance of using leisure time wholesomely and productively, emphasis upon ambition, etc., are components of the middle-class ethic and are values commonly shared by most university students. Although there is undoubtedly diversity among some value orientations within any large student body, it seems safe to assume much homogeneity regarding attitudes toward crime and especially toward the offenses that logical inference and empirical reference point as index offenses".

<sup>9</sup> The geometric mean ( $G$ ) is the  $n$ th root of the product of  $n$  numbers. It is usually more convenient to use the following formula:

$$\text{Log } G = \frac{\sum \log X}{N}$$

This illustrates the fact that the geometric mean is the

ence to "raw magnitude scale scores" is synonymous with the geometric mean of all subjects' scores. The table below presents the raw magnitude scale scores of all groups tested and also lists the comparable scores from the Philadelphia study.

In Figure 1 are plotted the raw magnitude scale scores of the fourteen offenses directly scored by both Montreal and Philadelphia subjects.<sup>10</sup> Figure 1 shows that there is, broadly speaking, a linear relation between the logs of the overall Montreal scores and Philadelphia scores. Similarly, when Montreal is broken down into males and females, each of these bears about the same relation to the Philadelphia scores. When Montreal males are compared with Montreal females, a similar linear relation appears.<sup>11</sup> (See Figure 2.)

The broad conclusion from Figure 1 is that there is evidence of a general agreement about the seriousness of offenses. It is not *merely* that Philadelphia and Montreal agree about what is serious and what is not; nor is it that Philadelphia and Montreal *merely* agree about that ranking of seriousness of offenses. What Figure 1 means is that there is a large amount of agreement about the numerical scoring of seriousness of offenses between both groups. Explicitly, one can say that, if the geometric means of offenses in both Philadelphia and Montreal are known, they are related by a power function of the form  $Y = aX^b$  where  $a$  and  $b$  are constant, estimated from the data. It should, perhaps, be recalled that when two variables are related by a power function this means that as one changes by a given percentage the other changes by another fixed percentage. The same conclusion holds for Montreal males compared with Montreal females.

Thus, hypothesis 1 is confirmed:—a constant comparable percentage of increase in the weighted seriousness of the judged violations of law relates the magnitude estimation scale of Philadelphia and Montreal.

However, hypothesis 2, about a comparable multiplicative power (or rate) of the constant increase, is not confirmed in toto, and appears to

arithmetical mean of the logarithms of the scores. Several limitations of the geometric mean exist. Among them are the fact that if any of the scores is zero, the geometric mean is zero. Also, if any of the scores is negative, the geometric mean may be meaningless. Subjects were instructed to use only finite, positive numbers in judging offenses.

<sup>10</sup> In fact, 15 offenses were directly scored, but offenses L1 and L2 have been pooled together under the label "minor assault".

<sup>11</sup> The correlation coefficients are all above .9 ( $r^2 = .9$ ).

Raw Magnitude Scale Scores for 15 Offenses  
Philadelphia and Montreal

Offenses	Philadelphia	Montreal Males	Montreal Females	Montreal Males and Females
* Larceny \$1.	16.93	2.07	1.42	1.89
A. Larceny \$5.	22.09	3.63	2.11	3.18
B. Larceny \$20.	27.77	6.69	6.20	6.57
C. Larceny \$50.	32.31	7.74	9.63	8.15
D. Larceny \$1,000.	52.90	28.60	30.50	29.10
E. Larceny \$5,000.	69.13	42.70	48.30	43.95
F. Burglary \$5.	40.62	6.05	12.80	7.21
G. Robbery \$5. (no weapon)	52.25	16.20	18.50	16.70
H. Robbery \$5. (weapon)	86.33	36.10	32.80	35.30
I. Assault (death)	449.20	452.00	246.00	291.00
J. Assault (hospitalized)	115.60	45.70	54.70	47.70
K. Assault (treated and discharged)	22.50	5.50	14.28	6.89
L <sup>1</sup> /L <sup>2</sup> . Assault (minor)	22.50	5.50	14.28	6.89
M. Rape (forcible)	186.30	146.00	119.00	139.00
N. Auto theft (recovered, no damage)	27.19	8.20	10.25	8.65

\* Derived by regression.

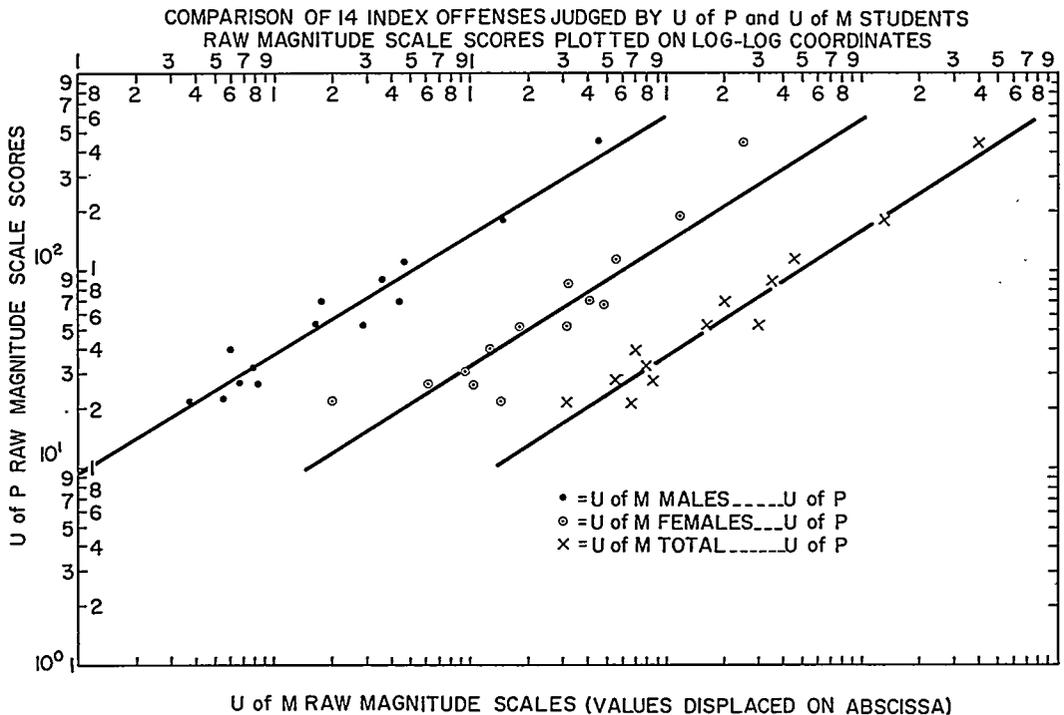


FIGURE 1

need reformulation. Sellin and Wolfgang have explicitly stated the mathematical relation between their own work and any future replication of it in a form which our results require to re-consider. They stated:

It should be remembered that the ratios of

score values, not necessarily the absolute numbers, have remained stable over the different rating groups used in the present study; and it is this ratio that would be important in further explorations. On the basis of our data, we would hypothesize that these rela-

COMPARISON OF 14 INDEX OFFENSES JUDGED BY U of M MALES AND FEMALES  
RAW MAGNITUDE SCALE SCORES PLOTTED ON LOG-LOG COORDINATES

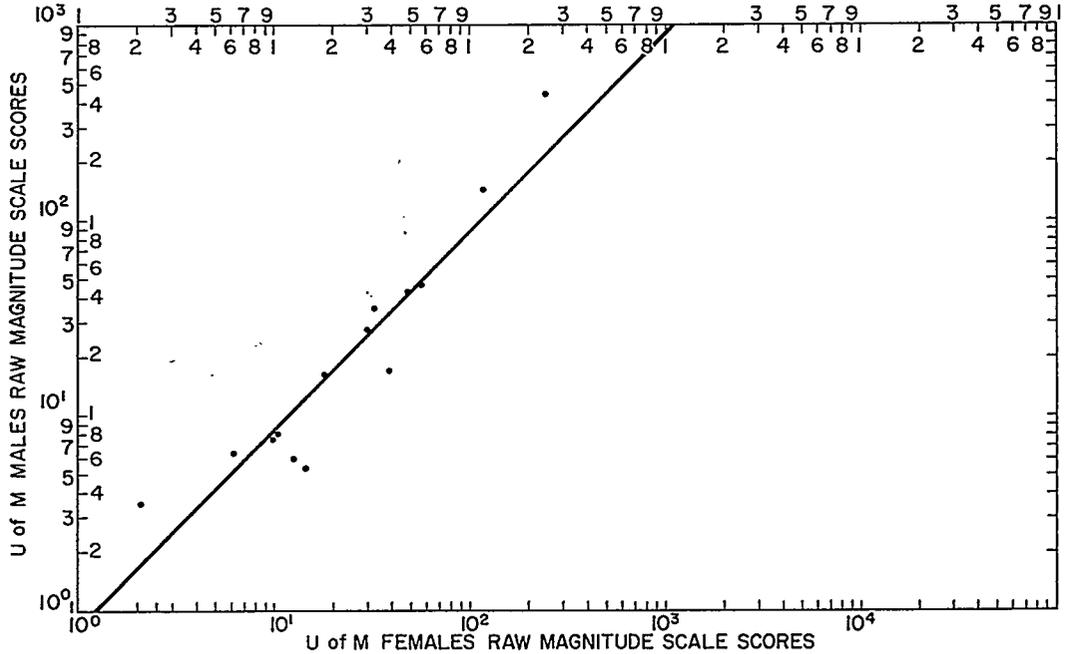


FIGURE 2

tive offense score values would be preserved. To be more specific, we would hypothesize that in a replication of the magnitude and category scales, the scale values for offenses would be represented by (1) a slope not significantly different from those in our study, or minimally (2) a straight line when plotted on semilogarithmic paper.<sup>12</sup>

Let us consider the two major statements in the above paragraph in the light of our results.

(a) *Similarity of slope.* The assertion was made that if the magnitude scale scores for index offenses were derived from a different population the slopes would be about the same. This means that if we plot the magnitude scale scores for the University of Pennsylvania against the magnitude scales scores for the University of Montreal we should expect a slope of 1 or thereabouts on log-log paper. This is not the case.<sup>13</sup> Inspection of Figure 1,

<sup>12</sup> *op. cit.*, p. 322-323.

<sup>13</sup> The exact slopes were:

1. U of P vs U of M : .593 or approximately 3/5 males
2. U of P vs U of M : .611 or approximately 3/5 females
3. U of P vs U of M : .647 or approximately 3/5 males and females
4. U of M males vs : 1.020 or approximately 1/1 U of M females

moreover, shows clearly that the slopes for Montreal males, females, and both of them combined, in regard to Philadelphia, differ from a slope of 1 by an appreciable amount.

A rough interpretation would be that concern about seriousness grows at a faster rate in Montreal than in Philadelphia, at least for the subjects tested. In fact, as seriousness triples in Philadelphia, it increases by five times in Montreal. It is this difference that makes the slope different. If Philadelphia had concern about seriousness that grew at a faster rate than Montreal, the slope would have been greater than 1; if both were the same, the slope would have been 1; and if Montreal had grown more concerned about seriousness than Philadelphia, then the slope would have been less than 1. Clearly, the last is the best description of the data, for the slope is roughly .6, or  $\frac{3}{5}$ .

It is interesting to note, however, that the statement about similarity of slope does hold for comparisons between Montreal males and females. Figure 2 shows that the slope is about 1 for the line drawn through the ratings of these two groups. From what can be inferred from the study of Sellin and Wolfgang, the slopes between Philadelphia judges, police, and students (on magnitude scale scores) are also about 1. Thus, roughly, there

have been no important differences discovered *within* cultures but there is some difference *between* cultures. However, the importance of this difference can be easily overrated. What is important is the fact that, although the slope is not 1, it is straight. This conclusion leads us to the analysis of the second statement made by Sellin and Wolfgang.

(b) *Similarity of shape*. If magnitude scale scores are plotted against category scale scores, then a straight line will result on semi-log paper. Sellin and Wolfgang, however, recommend using the magnitude scale as the better indicator of changes in delinquency or criminality, and their recommendation appears to be well founded. In fact, this scale was exclusively used in the Montreal study. The above statement cannot be tested directly, but it is easy to test a slightly different version of their statement; namely, if the magnitude scale scores of Philadelphia are plotted on log-log paper against the magnitude scale scores of Montreal, then the result should be a straight line. This is apparently the case. Figure 1 shows that this relation is essentially a straight line, and implies, therefore, that a given ratio change in one is associated with a fixed ratio change in the

other, e.g., if seriousness increases three times in Philadelphia, it increases five times in Montreal over the whole range of offenses. Similarly, if we knew the score for an offense in Philadelphia we could predict with considerable accuracy its score in Montreal and vice versa.

On the basis of the Montreal study, the two statements made by Sellin and Wolfgang may be slightly reformulated as follows:

*Minimum Claim:*

*If the magnitude scale scores of seriousness are derived for any two populations, the relation between them should be a power function of the form,  $Y = aX^b$  (the points plotted should constitute a straight line on log-log paper), it being understood that this applies to offenses defined by Sellin and Wolfgang as "index offenses".*

*Maximum Claim:*

*If the magnitude scale scores of seriousness are derived for any two populations in the same culture, the relation between them should be a power function of the form:  $Y = aX^b$  (the points plotted should constitute a straight line on log-log paper), and "where  $b = 1$ ". Again, this is taken to apply to index offenses only.*