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Additive law for emotional involvement

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The emotional involvement of people in events that occur in a distant city decreases with the increasing subjective distance of the city, according to a power function with exponent of -½ (Ekman & Bratfisch, 1965). This function, called the inverse square root law, was found by plotting ratio estimates of emotional involvement against ratio estimates of city distance and is only valid to a first approximation (Bratfisch, 1969; Lundberg, Bratfisch, & Ekman, 1972; Stanley, 1971; Strzalecki, 1978; Walmsley, 1974). The present study re-examined the inverse square root law using functional measurement (Anderson, 1981, 1982), which has the advantage over ratio estimation of allowing the determination of the yet unknown integration law that governs emotional involvement.

Preliminary experiment

For important cities Ekman and Bratfisch (1965) found that emotional involvement was larger than expected from distance alone. To minimize the effect of importance, cities with close mean rated importance were selected for the present study. Mean ratings of importance were obtained as follows.

Stimuli were city names presented on a monitor screen, individually to ten university students. The cities and their respective state were: Asmara (Eritrea), Banjul (Gambia), Bratislava (Slovakia), Copenhagen (Denmark), Dakar (Senegal), Fortaleza (Brazil), Johannesburg (South Africa), Kingston (England), Kunming (China), Lagos (Portugal), Lyon (France), Lisbon (Portugal), Rabat (Morocco), Sarajevo (Bosnia), and Valletta (Malta). These cities form five groups of three cities, with the great-circle distance of each city in a group being either about 500 or 1000 or 2000 or 4000 or 8000 km from Padua. Each city name was displayed below a horizontal line defining a 0-100 rating scale with 0 representing "Talca (Chile)" and 100 representing "Rome (Italy)". Participants were asked to rate how important

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was the city represented by the city name. The mean rated importance of the cities listed above was 51.2, 36.2, 54.3, 78.1, 47.9, 49.1, 55.5, 70.4, 36.7, 53.4, 79.4, 74.4, 52, 55, and 50.6, respectively. Five cities were selected with the condition that each city pertained to a different group of the above mentioned five groups of cities, and with the condition that the mean rated importance of the city was within the range from 50.5 to 55.6.

The cities finally selected as stimuli for Experiment 1 were Asmara, Johannesburg, Lagos, Sarajevo, and Valletta.

Experiment 1

Method

Participants. Fifteen university students (13 female, 2 male) with ages between 20 and 25 years participated in Experiment 1. None of them had participated in the preliminary experiment.

Stimuli. Stimuli were presented on a black 320 × 240-mm frontal parallel screen of a monitor controlled by a computer. Viewing distance was about 50 cm. Each stimulus was a sentence in yellow capital letters in an imaginary rectangular area of 10 × 1.5 cm. The sentence reported the news of an event occurring in one of the following cities (the state is in parenthesis): Padua (Italy), Sarajevo (Bosnia), Valletta (Malta), Lagos (Portugal), Asmara (Eritrea), or Johannesburg (South Africa). The distance from Padua of Sarajevo, Valletta, Lagos, Asmara, and Johannesburg was about 500, 1000, 2000, 4000, and 8000 Km, respectively. Each different stimulus was created by replacing *City (State)* in each of the following sentences with one different name of a city and respective state. In *City (State)* a fight has occurred between two passers-by with nobody being injured. In *City (State)* a train derailment has occurred in which a person was slightly injured. In *City (State)* an earthquake of moderate intensity has occurred in which one person lost their life. In *City (State)* a serious viral epidemic has occurred that has already caused a few deaths. Thus there was a total of 24 stimuli.

Each stimulus was presented below a horizontal 77 × 0.5-mm green line in the middle of the screen. The gap between the stimulus and the line was 30 mm. At the beginning of each trial a vertical 0.3 × 5-mm green line, called cursor, had its lower end touching the center of the horizontal line. The participant moved the cursor left or right by pressing one of two keys. The position of the cursor varied in steps of 0.76 mm. There were 101 different possible positions of the cursor. These positions were taken to represent the integers from 0 to 100. The writings “No involvement” and “Ex-

treme involvement" were written in green capital letters on the left and the right of the horizontal line, respectively. The gap between these words and the horizontal line was 7 mm. The screen was cleared when the participant hit a key. The horizontal line, cursor, writings and subsequent stimulus appeared 1 sec after this key was hit. The stimuli were presented to each participant in random order twice consecutively.

Procedure. The location of each city was shown to the participant on a map during the instructions. Participants were asked to rate the amount of emotional involvement that a University of Padua student had in the event described in the stimulus. They were asked to set the distance of the cursor from the left end of the horizontal line proportionally to the amount of emotional involvement. The left and right ends of the horizontal line denoted "no involvement" and "extreme involvement," respectively.

Results and discussion

Additive law

For each event, Figure 1 shows mean rated amount of emotional involvement plotted against geographic distance. It may be seen that, for each event, emotional involvement decreased as geographic distance increased, in agreement with Ekman & Bratfisch's (1965) original finding.

The near-parallelism of the curves implies the additive integration

$$\text{Emotional Involvement} = \text{Seriousness of Event} + \text{Distance of City}$$

which is supported by the nonsignificant interaction [$F(15, 210) = 0.98$].

The parallelism theorem of functional measurement implies that the marginal means of city are an interval scale of the subjective proximity of that city to Padua. Differences from the Padua mean thus yield the functional distances of each city from Padua, that is, from the participants.

Figure 2 shows mean rated amount of emotional involvement plotted against functional distance for each event. Essentially this rated amount decreased linearly with increasing functional distance.

Inverse square root law

The inverse square root law relates emotional involvement to measures of subjective distance of cities obtained by ratio estimation. Ratio measures of subjective distance and functional distance have a similar relation to geographic distance. The present finding that the rated amount of emotional in-

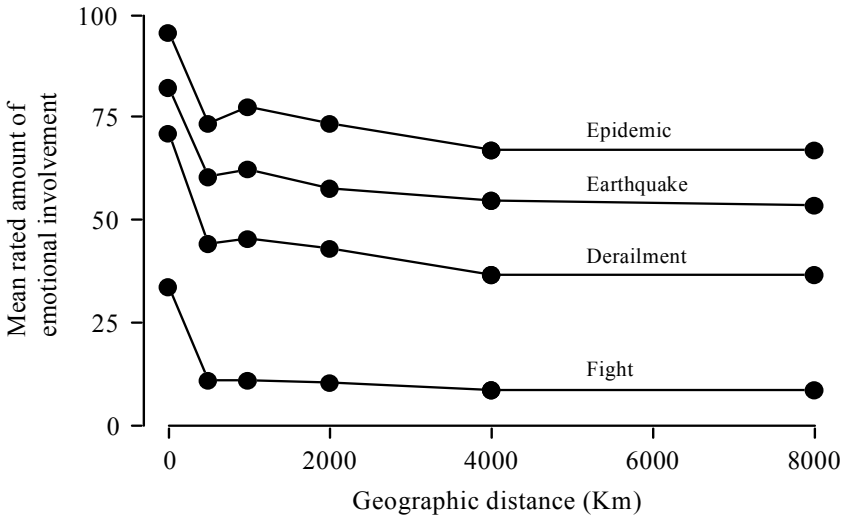

Figure 1. Mean rated amount of emotional involvement in various events, plotted against the geographic distance of the cities in which the events occurred.

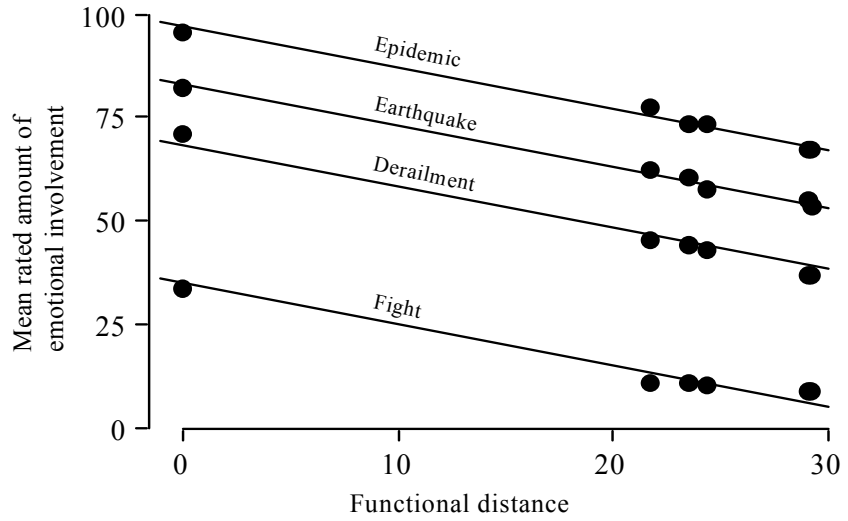

Figure 2. Mean rated amount of emotional involvement in various events, plotted against the functional distance of the cities in which the events occurred.

volvement decreased linearly with increasing functional distance rejects the inverse square root law. This law could be an artifact due to the fact that ratio estimates are invalid measures of mental magnitude (Anderson, 1996, p. 79). The present results are considered valid since they were obtained by functional measurement which yields true measures of mental magnitude.

Experiment 2

The effect of geographic distance on emotional involvement indicates that geographic distance could influence social behavior. Berezin & Díez-Medrano (2006) have found for example that the further an individual lives from Brussels the less likely is the individual to support European integration. Thus, one could predict that propensity to social action decreases with distance since emotional involvement decreases with distance. Experiment 2 was designed to test this possibility.

Method

Participants. Fifteen university students (12 female, 3 male) with ages between 18 and 26 years participated in Experiment 2. None of them had participated in the preliminary experiment or in the Experiment 1.

Stimuli. Stimuli and presentation conditions were the same as those used for Experiment 1.

Procedure. The procedure was the same as that used for Experiment 1 except for the following change. Participants were asked to rate how important was that Italian authorities intervened to help the persons involved in the event described in the stimulus. The left end of the horizontal line was defined to represent the judgment "absolutely not important" and the right end was defined to represent the judgment "extremely important".

Results and discussion

For each event, Figure 3 shows mean rated importance of intervention for help as a function of geographic distance. These results show that individuals think that intervention for help should be proportional to the gravity of events and inversely proportional to city distance. The linear component of main effect of distance of cities was significant both when Padua was included and excluded from the analysis.

Thus the additive law that applies to emotional involvement also applies to prosocial behaviour. That is,

$$\text{Prosocial Intervention} = \text{Seriousness of Event} + \text{Distance of City}.$$

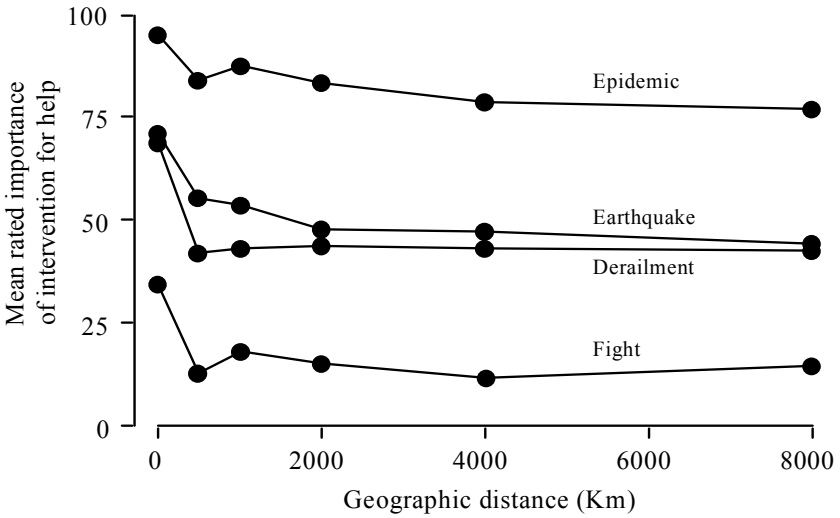

Figure 3. Mean rated importance of intervention for help in cities, plotted against the geographic distance of the cities in which the indicated events occurred.

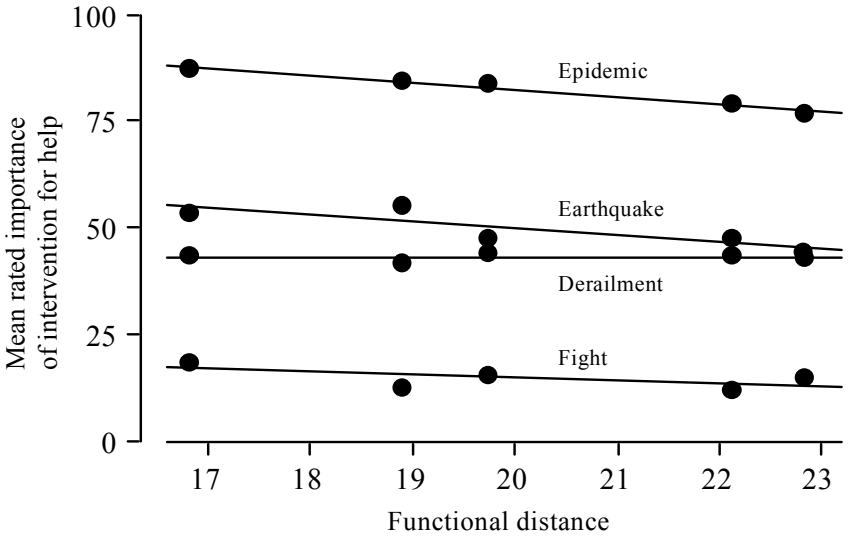

Figure 4. Mean rated importance of intervention for help in cities, plotted against the functional distance of the cities in which the indicated events occurred.

The size of the effect of distance on propensity to social action for help is smaller than that on emotional involvement (compare the slopes of curves in Figures 2 and 4). This difference may depend on the way in which instructions elicit information from participants. Perhaps a more sensitive measure of prosocial intervention would be the amount of aid the Italian Government should send.

General discussion

The results of the present study show that emotional involvement in events occurring in distant cities is ruled by the law: Emotional Involvement = Event + City. That is, participants judged their emotional involvement by adding the psychological relevance of the event to the psychological relevance of the city, with the relevance of the city being inversely related to the distance of the city. A similar law applies to prosocial intervention, that is, Prosocial Intervention = Event + City. These results are important for the planning of future social studies on the relation between individuals and various possible aspects of distant cities.

The functional distance of cities should include not only the subjective distance of cities but also any and all factors that might influence identification with the city, such as familiarity and nationality. This notion of functional distance could be readily applied to cities in Europe as well, and similarly to cities in specific countries. Besides, considering the broader scope of the notion of functional distance, one may predict that the additive laws found in the present study will extend to various other social domains beyond geographic distance to socio-economic distance or ethnic distance.

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Abstract

An additive law was found for emotional involvement with events in distant cities (Emotional Involvement = Seriousness of Event + Distance of City) and for prosocial intervention in such cities (Prosocial Intervention = Seriousness of Event + Distance of City). Functional measurement showed that emotional involvement decreased linearly as the functional distance of cities increased. Since this distance includes all factors that influence the identification with the city, the above additive law should be general and possible to extend to socio-economic or ethnic distance.

Riassunto

È stata trovata una legge additiva per il coinvolgimento emotivo in eventi che si verificano in città distanti (Coinvolgimento Emotivo = Gravità dell'Evento + Distanza della Città) e per l'intervento prosociale in tali città (Intervento Prosociale = Gravità dell'Evento + Distanza della Città). La misurazione funzionale mostra che il coinvolgimento emotivo diminuisce in modo lineare all'aumentare della distanza funzionale delle città. Dato che tale distanza include tutti i fattori che influenzano l'identificazione con la città, la legge additiva summenzionata dovrebbe avere validità generale ed estendersi anche alle distanze socio-economiche e etniche.

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