A Bayesian analysis of suicide data
Testing the Durkheim’s suicide theory: a suicide study in Italy

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Abstract The identification of change points in a sequence of suicide rates is one of the fundamental aspects of Durkheim’s theory. The specification of a statistical standard suitable for this purpose is the main condition for making inferences about the causes of suicide with distinctive trends of persistency and variability just as Durkheim theorized. At present, the statistical ‘strategy’ employed by the French social scientist is too ‘rudimentary’. A hundred years later, I take the opportunity to test Durkheim’s theory through modern methodological instruments, specifically the Bayesian change-point analysis. First of all, I analyzed the same suicide data which Durkheim took into consideration. Change-point analysis corroborates the Durkheimian analysis revealing the same change-points identified by the author. Secondly, I analyzed Italian suicide rates from 1864 to 2005. The change-point analysis was very useful. Durkheim’s theory ‘works’ until 1961: suicides rates increased as industrial development increased. However, after 1961 and the economic boom, they declined, and when they began increasing again, after 1984, they did not reach the same level as before. This finding obliges us to ‘adjust’ the Durkheim’s theory giving space to Halbwach’s convergence law. Therefore, as high economic and social development levels are attained, suicide rates tend to level-off: People adapt to the stress of modernization associated to low social integration levels. Although we are more ‘egoist’, individualism does not destroy identity and the sense of life as Durkheim had maintained.

Keywords Bayesian change-point analysis · Durkheimian suicide analysis · Convergence law · Italian suicide rates

1 Introduction

That Le suicide is one of the most prominent works ever to be produced within the Social Sciences is widely agreed upon. Although other social scientists had already shown, before
Durkheim, that suicide rates changed according to the degree of urbanization (Cazauvieilh 1840), religious affiliation (Wagner 1864), sex, age, civil state, seasons, day of the week, and even the time of the day (Morselli 1879), no author before him had ever dared to build a theory explaining nearly all the existing correlations. According to Giddens, Durkheimian originality and vitality lies in the successful explanation of these correlations in the framework of “a coherent sociological theory” (Giddens 1965, p. 5). According to Merton, Le Suicide is likely to be the greatest sociological research ever carried out (1967, p. 63). The Suicide’s basic premise is well known: suicide is conceived as the product of ‘suicide currents’, as the ‘symptom’ of states of a collective conscience constituted by egoism and anomy. The weakening of social cohesion, derived from that cultural revolutions originated from industrialization, raises suicide rates in unlimited progression. The result was an obsessive search for ‘remedies’ in order to stop this otherwise explosive increase.

Ever since then, a vast amount of research has attempted to identify the suitable indicators for measuring the degree of social integration and anomy and to correlate these indicators with suicide rates (e.g., Danigelis and Pope 1979; Tiryakian 1981; Wasserman 1984; 1990; Breault 1986; Simpson and Conklin 1989; Pescosolido 1990; Trovato and Voss 1990; Trovato 1991; Stack 1980, 1981, 1983, 1985, 1990, 1993; Kposowa et al. 1995; Breault and Kposowa 2000; Stockard and O’Brien 2002; Cutright et al. 2006, 2007). Sociologists have generally supported the Durkheimian theory: they found a significant positive correlation between suicide rates and urbanization rates, divorce rates, unemployment rates, religious, commitment, etc., and they concluded that domestic/religious individualism had positive effects on suicide.

Although interest in Durkheim is deserving, in my opinion the Durkheimian theory should be re-tested in a more systematic way by taking into account another very basic point that the literature has neglected perhaps because it takes its foundation for granted. In fact, one of the focal points of the whole Durkheimian theory is the study of the suicide variability rates from which Durkheim infers the effect of the industrialization process on the rise of suicide rates. This aspect represents the foundation of the whole theory, so much so that testing is indispensable. Durkheim had provided an empirical systematization with the methodological tools available in his lifetime. In this article, I test the Durkheimian hypothesis by examining its fundamental aspect with the more modern methodological tools at our disposal. In other words, I focus on the question of whether or not the use of these tools confirm the author’s findings and his consequential conclusions.

2 Change of suicide data in the Durkheimian analysis

Durkheim studied the variability of suicide rates by analyzing suicide data in France, Prussia, England, Saxony, Bavaria and Denmark from 1841 to 1872. In Table 1, I report some of these time series (Durkheim [1897] 1969, p. 66):

Durkheim shows the following trend from the time sequence of this data:

In a series of years where the figures have fluctuated with similar values there is a sudden increase. After opposite oscillations, it grows and finally stabilizes. It is a fact that every break in social equilibrium, even if it breaks out, takes some time to produce all of its consequences. So, the progress of suicide has a trend with consecutive and distinct flows. These flows appear as waves, develop for some time, then stop to start again at a later time (tr. 1969, p. 67).

In other words, Durkheim delineates the significant traits of an evolutionary process where the figures are substantially persistent and appear at a certain point to be interrupted by an