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DIALOGUE, DEBATE, AND DISCUSSION

Explanation versus Prediction in Management Research: A Comment on Zhang and Chen

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In my doctoral seminars, I often tell students that medicine is the discipline that best integrates teaching, research, and practice. I know personally a renowned surgeon who was a professor at a medical school. He taught students surgery, engaged in medical research, and published papers in top medical journals, as well as performed surgeries on patients. In fact, he and his colleagues invented a new surgical procedure that helped save patients' lives. Without a doubt, medical science has contributed substantially to the well-being of humankind. For example, the unprecedented speed of discovering new vaccines tremendously reduced the death toll of the COVID-19 pandemic that we all experienced and can still recall, often in a painful way. The remarkable progress medical science has made is demonstrated clearly when we compare the COVID-19 death rate with that of the Spanish Flu that occurred about a century ago.

Against this backdrop, I read with great interest Zhang and Chen's (2024) reflection on their extensive research of the COVID-19 pandemic's mental health impact around the world. These two researchers should be applauded for bringing to the attention of management researchers the characteristics of research and publication practices in medical fields. Zhang and Chen have certainly raised some fruitful ideas for management researchers to ponder and learn from, but there is one specific idea that needs clarification – 'While the primary objective of science, including social science, is to *describe, explain, and predict*, management scholars largely focus on explanation, paying less attention to description and prediction, which can be useful for themselves for many real-world applications' (Zhang & Chen, 2024: 343). In the context of their discussion, Zhang and Chen seem to suggest that management scholars' prioritizing of explanation over description and, in particular, prediction is undesirable. Yet, there are some good reasons for this preference, as I elaborate below.

Description, Explanation, and Prediction

To start with, a distinction should be made between description and explanation. As Bergmann (1957: 79) summarizes succinctly, 'description tells us what is there, explanation why it is there'. While readers of a news report may be satisfied with its description of an event, those of an academic journal paper often expect an explanation that would enhance their understanding of that event. Using the example of the COVID-19 pandemic, suppose a piece of news describes the transmission pattern of COVID-19 in a community. A paper published in a medical journal is expected to explain the pattern through, say, a certain mathematical model of infection that helps readers understand why that

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particular pattern and not others emerged. Thus, it is natural that, as Zhang and Chen (2024) note above, management researchers focus on explanation and pay less attention to description.

Prediction, however, represents a more complicated case. The somewhat equal emphasis on explanation and prediction in natural science can be traced to the famous deductive-nomological (D-N) model formulated by Hempel and Oppenheim (1948). The D-N model, which is deterministic in nature, depicts a regularity that whenever a set of events of kind C occurs, an event E will occur according to a set of general laws of kind L.[1] The D-N explanation consists of the following three main steps:

1) $L_1, L_2, \ldots L_m$ state that if $C_1, C_2, \ldots, C_n$ occur, then E will occur.
2) A set of existential statements confirms the occurrence of $C_1, C_2, \ldots, C_n$.
3) A deduced conclusion states the occurrence of E.

In other words, the D-N model represents an explanation in the form of a deductive syllogism in which a statement describing the event to be explained (the explanandum E) is a logically valid consequence of the explanans (general laws and existential statements). The general laws (Step 1) establish an explanatory connection between the antecedent conditions (Step 2) and the explanandum E (Step 3). To illustrate, suppose a metal ball is hung above the ground by a piece of string. The law of gravity states that in this case, if the string is cut, the ball will fall to the ground (Step 1). The string is cut (Step 2). Then the ball falls to the ground (Step 3). Steps 1–3 together explain why the event of the ball falling to the ground was observed.

A crucial characteristic of the D-N model is that 'the logical structure of a scientific prediction is the same as that of a scientific explanation' (Hempel, 1942: 38), resulting in a symmetry between explanation and prediction – every sufficient explanation is a potential prediction and every prediction is a potential explanation. In the above metal ball example, when the ball is hung by a string above the ground, the ball is predicted to fall to the ground (Step 3) when the string is cut (Step 2) according to the law of gravity (Step 1). The symmetry between explanation and prediction accounts for the somewhat equal emphasis on explanation and prediction in natural science. Yet, this symmetry does not hold in social science.

Social versus Natural Science

Everyday observations indicate that it is often more difficult to predict phenomena in the social world than phenomena in the physical world. For instance, in the late 1980s, few political scientists managed to predict the collapse of the Soviet Union. Zubok (2021) traced meticulously the path leading to the collapse. Along this path, there was no shortage of idiosyncratic behaviors and chance events, which were, by their very nature, unpredictable. Thus, the dissolution of the Soviet Union can be explained retrospectively but not be predicted and, in this sense, explanation and prediction are not symmetrical. This is why Popper (2002) criticizes severely historicism that takes historical prediction as the principal aim of research. In contrast, astronomers could predict accurately the 2024 Great North American Eclipse decades before it happened. In fact, I observed from the backyard of my house on April 8 the eclipse starting at exactly the time announced in the news. This precision of prediction is due to the fact that the planetary system is a closed one in which 'a constant conjunction of events obtains; i.e. in which an event of type a is invariably accompanied by an event of type b' (Bhaskar, 1978: 70).[2]

The open-system character of the social world implies that events are subject to diverse causal variations, making predictions difficult, if not impossible. As management is a social science discipline, it makes sense for management researchers to focus on explanation rather than prediction, especially in the early stage of investigating a new phenomenon. For example, working from home became a common practice during the COVID-19 pandemic and management researchers might like

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to study the impact of work-from-home on employee productivity. Instead of attempting to predict the impact based on existing theories, a more fruitful approach would be to identify mechanisms that connect work-from-home to productivity. One probable mechanism is that without the chance to meet colleagues face to face, which is the most effective form of interpersonal communication, the ability of an employee to solve problems or generate new ideas is curtailed, hurting the employee's productivity. By engaging in mechanism-based explanation – a popular form of explanation in social science (Hedström & Ylikoski, 2010) – management researchers would gain a better understanding of how work-from-home affects productivity. Such research results could serve as the basis for making predictions in a very cautious manner, if needed.

A Concluding Remark

I appreciate Zhang and Chen's (2024) attempt to highlight the merits of research and publication practices in medical fields that would benefit the management discipline. That said, they do not seem to be aware that, due to the intrinsic differences between natural and social science, there are practices not applicable to management research; placing equal emphasis on explanation and prediction is one such practice. In management research, therefore, it is entirely reasonable that explanation should play a more significant role than prediction.

Notes

1. There is a probabilistic version of the D-N model, called the inductive-statistical (I-S) model. The I-S model is more suitable for medical research. For instance, there is a certain probability that one suffers from side effects after taking a COVID-19 vaccine. Owing to space constraints, I focus on the D-N model only.
2. Needless to say, precise predictions are not feasible in every natural science discipline. Earthquakes, for example, are still unpredictable.

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