The Measurement of "Interdisciplinarity" and "Synergy" in Scientific and Extra-Scientific Collaborations

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Problem-solving often requires crossing boundaries, such as those between disciplines. When policy-makers call for "interdisciplinarity," however, they often mean "synergy." Synergy is generated when the whole offers more possibilities than the sum of its parts. An increase in the number of options above the sum of the options in subsets can be measured as redundancy; that is, the number of not-yet-realized options. The number of options available to an innovation system for realization can be as decisive for the system's survival as the historically already-realized innovations. Unlike "interdisciplinarity," "synergy" can also be generated in sectorial or geographical collaborations. The measurement of "synergy," however, requires a methodology different from the measurement of "interdisciplinarity." In this study, we discuss recent advances in the operationalization and measurement of "interdisciplinarity," and propose a methodology for measuring "synergy" based on information theory. The sharing of meanings attributed to information from different perspectives can increase redundancy. Increasing redundancy reduces the relative uncertainty; for example, in niches. The operationalization of the two concepts—"interdisciplinarity" and "synergy"—as different and partly overlapping indicators allows for distinguishing between the effects and the effectiveness of science-policy interventions in research priorities.

References

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