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CAN THE INTERDISCIPLINARITY OF COGNITIVE SCIENCE BE SAVED THROUGH DECONSTRUCTION?

Abstract. This paper discusses the resources for deconstruction offered by cognitive science, drawing inspiration from David Gunkel's work on the topic (*Deconstruction*, MIT Press 2021). The gesture of deconstruction is seen as having a positive impact on the development of this interdisciplinary field by challenging misleading dichotomies and examining its underlying assumptions, such as the symmetry of integration.

Keywords: deconstruction; interdisciplinarity; cognitive science; integration; symmetry

1. Introduction. 2. A rupture in the heart of cognitive science. 3. Integration. 4. Symmetry. 5. Conclusion.

1. INTRODUCTION

Deconstruction, according to Derrida, is “what remains to be thought beyond constructionist and destructionist schema” (Gunkel 2021, 2). In this paper, I aim to investigate some ways to approach interdisciplinary research in cognitive science, which occupies a unique position as both a discipline and an inter-discipline. Precisely this feature can present a number challenges to cognitive science, such as maintaining its disciplinary status in the face of both a theoretical drive towards unification and a practical drive towards fragmentation. However, I do not try to suggest that we should abandon the concept of interdisciplinarity altogether. Instead, through the gesture of deconstruction, i.e. repetition and difference, we can challenge and move beyond inherited oppositions such as integration *vs.* fragmentation, cooperation *vs.* domination, and symmetry *vs.* asymmetry (but also: unified *vs.* fragmented, disciplinary *vs.* nondisciplinary, hierarchical *vs.* heterarchical, etc.).

In doing so, we can open up a space for a more nuanced and rich understanding of interdisciplinary practice in cognitive science.

2. A RUPTURE IN THE HEART OF COGNITIVE SCIENCE

As we are often reminded, cognitive science is or at least should be interdisciplinary. It is frequently cited as the prototype of an interdisciplinary research field in both cognitive science literature (e.g., introductions, overviews, companions, handbooks, encyclopedic entries, programmatic papers, etc.) and beyond (see Nowakowski 2019, footnote 1). However, such emphasis on interdisciplinarity often comes with unacknowledged assumptions, such as the notions of integration and symmetry. These assumptions are often taken as indications of progress or order in cognitive science, but they deserve further examination. In this paper, I will explore these assumptions in more detail.

Despite the complex history of cognitive science (Cohen-Cole 2007), the hexagonal model proposed by Gardner (Gardner 1985) has come to dominate the field's collective imagination. The hexagon, which shows the relations between different cognitive subdisciplines, has become the iconic image of cognitive science as a singular entity.¹ According to this model, cognitive science is the result of a balanced, symmetrical integration of psychology, AI, linguistics, neuroscience, philosophy, and anthropology (see, e.g., the "integrative challenge" in Bermudez 2014).² This idealized model of cognitive science is both a standard to strive for and a source of constant disappointment when

1 I intentionally omit the original publication containing this picture, the Sloan Foundation Report (Keyser, Miller, Walker 1978) because there is no evidence that the account outlined in the Sloan Foundation Report had been accepted prior to Gardner's publication.

2 Bermudez (Bermudez 2014) proposed a three-dimensional model of integration in cognitive science, which focuses on integrating models from different disciplines rather than the disciplines themselves. Despite this, his vision for cognitive science is highly unifying and advocates for an equal representation of all disciplines within the hexagon.

actual models fall short. The gap between the idealized version of the field and the actual practice of cognitive scientists widens and deepens, with implications for both symmetry and integration.

3. INTEGRATION

Interdisciplinary research is a complex and varied phenomenon, and there are different classifications of the types of interactions between disciplines (Van den Besselaar, Heimeriks 2001; Thompson, Klein 2010). Interdisciplinary investigations are often described as combining disciplines to create a new, integrated or even unified field, such as biochemistry (see Boden 1999; Thompson Klein 2010). This view is widely accepted by most cognitive scientists and probably philosophers of cognitive science as well (see Núñez *et al.* 2019). However, although interdisciplinary research is common, the successful integration of disciplines as in the case of biochemistry is rare (the only example of successful integration in cognitive science seems to be psycholinguistics – Abrahamsen 1987).

Both cognitive scientists and philosophers of cognitive science acknowledge that a gap exists between the idealized “hexagonal” version of interdisciplinarity in cognitive science and its actual practice. Despite this, the duality of interdisciplinarity as imagined and as practiced is still maintained in the field. Some may argue that this duality is simply the result of the gap between a regulative ideal and research practice, but this is not the case. The hexagonal model proposed by Gardner plays no real role outside of theoretical overviews and introductions. This duality is instead a sign of the presence of deconstruction, piercing the interdisciplinary heart of cognitive science.

It is important to note that interdisciplinarity and integration (unification) can and often diverge. Grüne-Yanoff (Grüne-Yanoff 2016) provides examples of interdisciplinary research (such as the combination of game theory and evolutionary biology) that is successful

without resulting in the formation of a new interdisciplinary field. The history of cognitive science also supports this idea. For instance, the work of Miller and Bruner at Harvard's Center for Cognitive Studies (1960-1972) was highly interdisciplinary (see Cohen-Cole 2007), and successful in terms of its impact on the work of its funders (such as Miller's work on the psychology of language). Despite this evident success, the Center's work in terms of integration should be considered a failure, as it did not produce a new discipline but simply benefited psychology.

Most studies on collaboration between disciplines focus on how their cooperation can solve pressing problems (Schmidt 2011). Such studies often focus on effective communication, mutual understanding, and cross-disciplinary use of methods, technologies, or techniques. Success in these cases often depends on using a new method or looking at an old problem from a fresh perspective.

Surprisingly, success can also come from failure (Mäki 2016), such as misunderstanding or misusing a new method or technology. Interdisciplinarity occurs when different disciplines come together and interact, whether in pursuit of cooperation, mutual understanding, or even in recognition of the limitations of their own concepts and methods (Boon 2020). Interdisciplinarity is not only about gaining knowledge from other disciplines, but about understanding or being confronted with the limitations of one's own field or discipline (e.g., to avoid becoming a "trespasser"; see Ballantyne 2019).

Interdisciplinarity is too complex and heterogeneous to be reduced to integration, and integration is too rare to make interdisciplinarity dependent on it.³

³ It is not clear what integration is or why it is necessary. If forming a new inter-discipline depends on integration, and the only criterion for successful integration is the formation of a new discipline, this seems somewhat circular. We need something more, but what is it?

4. SYMMETRY

The need for integration is often explicitly emphasized when discussing the interdisciplinary nature of cognitive science, such as in Bermudez's proposal of an "integrative challenge" (Bermudez 2014). The issue of symmetry is somewhat different. Recent criticism of this feature of cognitive science has been voiced by Núñez (Núñez *et al.* 2019), who argue that the lack of an equal representation of the six disciplines depicted in Gardner's (Gardner 1985) hexagonal model in cognitive science study programs and the unequal disciplinary distribution of papers published in major cognitive science outlets are flaws.

As previously mentioned, symmetry is a prominent feature of Gardner's (Gardner 1985) hexagonal model. None of its nodes is larger than the others, and the distances between them are roughly equal. Let's add that, the vertical dimension of the hexagon has not been considered significant (i.e., the top node is as important as the bottom one).

However, it is not clear why this balance is considered advantageous. Collaboration is often asymmetrical (see Porcelli, Teller 2019), both in terms of vertical relationship between disciplines (e.g. in the context of theoretical reduction) and horizontal relationship, where one discipline may dominate and impose its methods, concepts, and standards (epistemic and ethical) on others. This kind of imperialism has been recognized not only in philosophy of science (see Mäki, Walsh, Pinto 2017), but also in cognitive science, as evidenced by the discussion of psychological imperialism (Barsalou 2010; Gentner 2010), as well as the findings (Núñez *et al.* 2019).

While this kind of imperialism is often seen as a problem, this may not always be the case. If psychology or biology are better suited for studying cognitive tasks, why shouldn't they "imperialize" cognitive science? Shouldn't our goal be research progress rather than seeking a balance between arbitrarily combined disciplines? (see Miller 2003).

5. CONCLUSION

Interdisciplinary research is often problem-centered (Schmidt 2011). Its methods, rules, and concepts are formed during the research process, and researchers learn to collaborate while collaborating (Freeth, Caniglia 2020). There is no manual for interdisciplinary research other than a willingness to learn and a humble awareness of one's own limitations. It is local and driven by divergent, sometimes conflicting interests. Even in the case of a seemingly fixed disciplinary structure like cognitive science, there is an almost limitless number of combinations and differences in the techniques, methods, and standards employed.

Perhaps, then, we (as cognitive scientists and philosophers of cognitive science) should reevaluate our ideas about interdisciplinarity and, through the gesture of deconstruction, embrace its divergence, constant transformation, and move toward a less stable and more inclusive state. For our common good, we should focus less on preconceived notions and more on the richness and complexity of the problems we face.

Is the proposed gesture truly deconstructive, or is it a deconstruction of deconstruction? Have I understood the message of Gunkel (Gunkel 2021) correctly, or have I failed badly?

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