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# On the Forming of Unified Field Theories

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## I. INTRODUCTION

To take readers behind the scenes of the formation of another article in this volume, *A "Grand" Unified Negotiation Theory… in Context*,[1] I'll share that as the authors of that piece - Adrian Borbély, Chris Honeyman, Sanda Kaufman, Andrea Kupfer Schneider and myself - discussed the nature of a unified theory for the negotiation field, we were cognizant of the associations between our own search and the more famous (for the time being, at least) search for such theory in the field of physics. As we noted in an early draft:

> "The aspiration to see the different strands of negotiation research and practice come together in a theory resembling those of the natural sciences is not of recent vintage . . .
>
> When someone mentions the idea of a "grand" unified theory, perhaps the "Big Bang" or relativity come to mind. We will admit right now that the elegance and simplicity of the most famous theories in physics are bound to elude our field, probably permanently. Unlike physical particles, negotiation deals with human beings, with agency and with all of their contradictory, perplexing and shifting preferences and dimensions…"[2]

In this Article, I will provide some reflections on these intuitive associations between the worlds of negotiation and of physics, in their searches for comprehensive explanations of the phenomena they respectively explore. While the connections between these two searches might be, at best, associative – they may still provide the negotiation field some reflective food for thought. While searching for one unifying theory underlying the forces and elements of negotiation activity, or even for theory explaining clusters of these elements, we might be well served by a clarification of the term we associatively connect with the realm of theoretical physics, and a reminder of some of the history and characteristics of the process of searching for such theory.

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1. Adrian Borbély et al., *A "Grand" Unified Negotiation Theory… In Context*, 2017 J. DISPUTE RESOL. (forthcoming 2017) (hereinafter *A "Grand" Unified Negotiation Theory*).

2. Adrian Borbély et al., *A "Grand" Unified Negotiation Theory… In Context* (Dec. 30, 2016) (unpublished draft) (on file with author).

## II. UNIFIED FIELD THEORY IN THE PHYSICAL WORLD

In the world of physics, the search for 'grand' or 'unifying' theories has focused on explaining interactions between forces and elements in the physical world.[3] This search has come a long way, particularly over the course of the past century – but has yet to culminate in a perfect and unanimously adopted mechanism for explaining these forces.

After Albert Einstein described his special theory of relativity in 1905[4], and general theory of relativity in 1915[5], he dedicated much of the rest of his career to two main pursuits. The first was exploring, and then working to debunk, the theory of quantum mechanics – a system for understanding the behavior of sub-atomic particles - as an alternative explanation to the physical nature of the universe. [6] Quantum theory, in a nutshell, incorporates a great deal of unpredictability and uncertainty into the heart of our understanding of the universe.[7] Under the paradigm it proposes, it is only when a phenomenon is observed that it actually 'happens.'[8] Before it is observed, it is only a probability factor.[9] Even though Einstein's own work – particularly the theoretical basis he provided for the photoelectric effect, which won him the Nobel Prize in 1921 – laid a significant piece of the groundwork for quantum mechanics' development, he refused to accept a view of the universe that axiomatically revolved around uncertainties and probabilities, rather than measureable and predictable phenomena.[10] Or, to paraphrase his own famous words on the topic, he refused to accept that God, acting through the forces of nature governing the physical universe, does so through constantly rolling dice.[11]

Einstein's second pursuit was seeking a *unified field theory*, which would provide a combined explanation joining the force of gravity (explained by his theory of general relativity), together with the force of electromagnetism, into a single field that determined and explained the actions of all physical elements of the universe.[12] While Einstein considered himself (subjectively, as I will note below), to have succeeded in his first pursuit, he never succeeded in the second.[13] Struggling with it until his death in 1955, he could not explain these two forces in terms of a common field.[14] Quantum mechanics, interestingly, is stymied by a comparable challenge at

3. *See* Glen Mackie, *How the search for a unified theory stumped Einstein to his dying day*, PHYS.ORG (Nov. 30, 2015), https://phys.org/news/2015-11-theory-stumped-einstein-dying-day.html; Tim Folger, *Einstein's Grand Quest for a Unified Theory*, DISCOVER, Sept. 2004, http://discovermagazine.com/2004/sep/einsteins-grand-quest; Sunil Mukhi, *String Theory and the Unification of Forces*, http://theory.tifr.res.in/~mukhi/Physics/string.html (last visited May 1, 2017).

4. Albert Einstein, *Zur Elektrodynamik bewegter Körper*, 17 ANNALEN DER PHYSIK 891–921 (1905).

5. *Id.*

6. Folger, *supra* note 3.

7. *Id.*

8. *Id.*

9. *Id.*

10. *Id.*

11. Einstein used different variations of this metaphor in his writing. *E.g.*, WILLIAM HERMANNS & ALBERT EINSTEIN, EINSTEIN AND THE POET: IN SEARCH OF THE COSMIC MAN 58 (1983) ("As I have said so many times, God doesn't play dice with the world.").

12. Mackie, *supra* note 3; Folger, *supra* note 3.

13. Mackie, *supra* note 3; Folger, *supra* note 3.

14. Mackie, *supra* note 3; Folger, *supra* note 3.

a similar developmental point, unable to incorporate gravity in a field with the other forces.[15]

## III. PHYSICS AND NEGOTIATION: THE SEARCH FOR UNIFYING THEORY

What does all this have to do with negotiation? Given the differences between the fields of theoretical physics and of negotiation theory, and the behaviors they are trying to explain, it could well be that extrapolating anything from one to the other is far more an act of association than of science. However, stepping back from the target phenomena, the two searches for overall theory have shared characteristics. Each involves human activity in seeking to gain overall understanding connecting fundamental scientific principles explaining real-world phenomena. There may be something to learn here, regarding the way humans gather knowledge, theorize, approach and screen evidence, engage with other scientists and, theories, and debate. And, if all this is associative, then at the least, we are provided with a collection of helpful metaphors as we discuss a unifying theory of negotiation. Perhaps some of these extend beyond metaphor, though, to offer instructive parallelisms; still others may simply be scientific and academic truths and patterns we can harness in our own exploration.

Einstein searched for a unified field theory, explaining how basic forces of nature affect the behavior of all physical elements. [16] Of course, he based his thinking on those particles he knew of – and needed to adjust when new particles, such as the nucleus, discovered in 1932, arrived on the scene. [17] Others, such as boson subtypes, continue to be discovered after his death.[18] Similarly, underlying Einstein's efforts to create a unified field theory was the assumption that he was familiar with all the physical forces that existed: gravity and electromagnetism. [19] As time went by, new forces were discovered (dubbed *strong* and *weak* nuclear force[20]). Currently, to greatly simplify one of the most complex topics imaginable, it is accepted that it is possible to explain all these forces' effects together in a single field *except* gravity.[21] This explanation of the triad of forces is known as the 'Grand Unified Theory.'[22] Successfully incorporating gravity's effects together with these other three would now be considered a 'Theory of Everything.'[23] Such a Theory of Everything, the Holy Grail of Einsteinian physics, might be discovered through development of string theory.[24] However, we note, that like every physical theory that has ever existed, it assumes that we now know, or can at least predict, all the particles and forces that exist in the natural world. Does such an assumption extend to the realm of negotiation?

15. Mukhi, *supra* note 3.
16. Mackie, *supra* note 3.
17. *Id.*
18. *Id.*
19. *Id.*
20. *Id*
21. Mukhi, *supra* note 3.
22. Matthew R. Francis, *A GUT feeling about physics*, SYMMETRY (Apr. 28, 2016), http://www.symmetrymagazine.org/article/a-gut-feeling-about-physics.
23. *Id.*
24. Mukhi, *supra* note 3.

Approaching the world of negotiation theory with the experience in unifying theory gained in the world of theoretical physics, three parallelisms present themselves. The first, is the difficulty of connecting the notion of constants with the notion of dependencies or probabilities. The history of theoretical physics includes a clash between the desire to identify, define, and predict the way things are and how they will act, and the persistence of irregularities or inconsistencies to arise, particularly when exploring the tiniest of variables. This challenge correlates, or at least corresponds, to our own challenge in explaining the building blocks of negotiation with the currents, nuances and subjectivity inherent in a contextual perspective. As we wrote in *A "Grand" Unified Negotiation Theory,* "For now, most of our negotiation theory-building efforts tend to stop where context begins."[25] General negotiation theory and particular context currently appear to be two separate fields that we do not yet know how to unify; the stratification approach suggested in that Article provides an attempt to do so. It may turn out, though, that general negotiation theory and context are more aptly conceptualized as metaphoric manifestation of a key element of quantum mechanics, Heisenberg's Uncertainty Principle.[26] Per this principle, if we know, with certainty, one quality of a particle, we cannot know another quality with certainty[27]. If we know its position, we can only guess at its speed; if we know its speed, we can only predict its position.[28] So, too, we might know that an element of negotiation theory *generally* holds true across contexts, however, perhaps we cannot *precisely* predict how it will play out in any particular context.

The second parallelism, is the tendency of scientists themselves to assume that they know what there is to know, and that now all that is left to do is explain it all together, in terms of one shared field. This power of this tendency is incredibly strong; in string theory, for example, scientists have assumed, predicted, or created between ten and twenty different dimensions, to explain those parts of the physical world that do not fit into Einstein's 'simpler' model of how physical forces interact. [29] Pursuing understanding of the fundamental forces of negotiation, we have become aware, relatively early on, to the fact that there are forces yet unknown to us. As *A "Grand" Unified Negotiation Theory* has described, recent efforts have systematically maintained open channels for the discovery and assimilation of new forces rather than work towards the sealing and codification of a canon.[30] Still, earlier, all-explaining, models of negotiation persist. As the preliminary explorations of the educational practices of the field conducted by the Rethinking Negotiation Teaching Project uncovered, these have continued to disproportionately affect the core of negotiation education even after new forces and elements had been discovered; it may yet take a while for these effects to wear off.[31]

A third, forward-looking, parallelism, would be the value of constructively channeling the flow of any disagreement, such as are bound to emerge as approaches and worldviews vie to pose competing overall theoretical explanations.

25. Borbély et al., *supra* note 2.

26. Werner Heisenberg, *Ueber den anschaulichen Inhalt der quantentheoretischen Kinematik and Mechanik*, 43 ZEITSCHRIFT FÜR PHYSIK 172-98 (1927).

27. Folger, *supra* note 3.

28. *Id.*

29. Mukhi, *supra* note 3.

30. Borbély et al., *supra* note 2.

31. *See* CHRISTOPHER HONEYMAN ET AL., RETHINKING NEGOTIATION TEACHING: INNOVATIONS FOR CONTEXT AND CULTURE 2 (2009).

Such constructive channeling would involve encouraging the emergence of multiple overall theories, while mitigating the costs of infighting. The Talmud teaches that "'Envy between scribes increases wisdom'"; *i.e.,* competition amongst authors generates more knowledge, overall.[32] However, this holds true only to a certain extent, and often comes with a price tag. The discourse between Einstein and other physicists advocating quantum theory was acrimonious, diminishing cooperation and mutual respect amongst members of the two schools of thought.[33] This competition was never fully settled, even when events provided an opportunity for both sides to win. Einstein became certain, in 1935, that he had absolutely succeeded in refuting quantum mechanics.[34] Quantum physicists, on the other hand, were equally certain that he had not. [35] Each school of thought continued its own path of exploration.[36] Einstein's standard model of physics and quantum theory continue to appear mutually exclusive (although the latter tries to subsume parts of the former under its own paradigm).[37] Not only have the two approaches never found the substantive path to a reconciliation that would better explain the mechanics of the physical universe; the subjective victory each approach experienced (Einstein in refuting quantum mechanics, and quantum mechanics in withstanding Einstein's critique) was never enough. In conflict, we often find that one party cannot fully experience victory unless the other has expressed defeat. Each school of thought continues to operate, to some extent, in a state of conflict vis-à-vis the other, rather than focusing on its own path.

## IV. CONCLUSION

Efforts at unifying theory - in any field – are likely to bring several issues to a point. For one, they involve the sincere search to identify and highlight 'good' or 'correct' theory, as opposed to less precise theory or opinions. Such efforts, of a necessity, present moments at which even generally inclusionary approaches apply exclusionary sifting. For another, as human endeavors never operate in a vacuum absent of the human ego, the previous issue is exacerbated by individual and group yearning for recognition, or for vindication of worldview. Like any other area, the conflict and negotiation field has experienced rifts amongst people and approaches. As efforts to offer comprehensive explanations for negotiation phenomena inevitably raise the stakes, one hopes that the negotiation field will successfully apply, in practice, its theoretical expertise in cooperation and engagement across multiple worldviews.

32. BABYLONIAN TALMUD, Tractate Bava Batra 21(a) (Noam Ebner trans.).
33. Folger, *supra* note 3.
34. *Id.*
35. *Id.*
36. *Id.*
37. A. DOUGLAS STONE, EINSTEIN AND THE QUANTUM: THE QUEST OF THE VALIANT SWABIAN 3 (2013).