

Research Development & Grant Writing News

From Silos to Synergy: The Yellow Brick Road of Grant Writing

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Much has been written and presented on the topics of team science and the science of team science, e.g., [NIH Collaboration and Team Science: A Field Guide](#), [NIAID Opportunities and Guidelines to Facilitate Scientific Collaborations](#), [NSF Profiles in Team Science](#), [The Science of Team Science: Origins and Themes](#), and Burroughs Wellcome Fund [Thriving In An Era Of Team Science](#), among hundreds of other contributions to the literature of this field. This commentary typically converges on common denominators and generic best practices relevant to these two topics. However, the toughest nut left uncracked is the very practical one of **how does successful team science impact, or translate into, the writing of a successful proposal?**

Successful in this context means a funded proposal, or at least a highly competitive proposal hugging the funding line sufficiently closely to warrant confidence in a successful resubmittal.

Defining the key characteristics of the successful research team--shared vision, compelling ideas, leadership, trust, communication, interpersonal dynamics, etc.--obliquely addresses issues that will be critical if the research team is to develop and write a successful proposal. However, success will depend upon a very specific and detailed understanding of how the research narrative of a team science proposal differs from the research narrative of the individual PI proposal or a proposal that aligns but does not need to integrate a few PIs.

Keep in mind, too, that many members of a research team come to it by way of funding success as an individual PI or as a member of a funded proposal with a few PIs, but likely not with experience at the scale and scope of a large interdisciplinary or transdisciplinary proposal. By their very nature, these proposals involve high award dollars; complex, interrelated research topics; and a challenging research development and grant writing process. Regardless, the best advice to beginning the team science proposal was given to Dorothy in the Wizard of Oz: "Follow the Yellow Brick Road."

The Yellow Brick Road of grant writing is not a path from Munchkin Country to the Emerald City of the Wizard of Oz films but rather **a path leading from silos to synergy**, the latter being the Emerald City of the successful proposal. Moreover, the path from silos to synergy is likely the most challenging road traveled by the author of a funded proposal. As a core goal of the successful project description, narrative synergy is central to a successful proposal, particularly as solicitations address research objectives that require multi- or transdisciplinary teams aligned in often novel configurations.

Moreover, the degree to which a proposal narrative is siloed often is a function of how wide an interdisciplinary net needs to be cast in order to be competitive for a specific solicitation. For example, some research requires only an individual principal investigator working in a very narrowly defined topic area to be competitive, while other research solicitations may require aligned but not integrated research activities by a few principal investigators, whereas other proposals of a transdisciplinary nature require a deep synthesis of the research contributions of team members.

The ideal foundation of narrative synergy is an integrated research team characterized by a substantive understanding among team members of the role each member's research

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plays in the overall effort. However, something less than that ideal is the more common occurrence in developing and writing research narratives whose success depends heavily upon the skillful description of the value-added benefits resulting from disciplinary synergy. Unfortunately, most proposal drafts begin with multiple silos contributed by multiple authors, and from that starting point the somewhat arduous path from silos to synergy begins.

Synergy begins with a connectedness deepened by integration. Some synergy is brought to the proposal development process by the selection of the research team itself in order to fully respond to the solicitation; however, this initial synergy significantly deepens and broadens from the interaction of the team members in planning and writing the research project description, particularly as the scale, scope, and synthesis of the project vision, goals, and objectives become more fully defined, illuminated, and honed with each draft iteration.

The process of writing multiple draft iterations of the research narrative amounts to a discovery process in itself. It advances and deepens the understanding of each research team member about how to best optimize the configuration of research capacities and expertise across disciplines in a way that convincingly demonstrates the value-added benefits of the proposed project to the funding agency. The path from silos to synergy is essentially the same path from an unfunded to a funded proposal, or from failure to success in grant writing.

In its most extreme manifestation, the siloed proposal is easily diagnosed. It essentially reads like a collection of journal articles written by independent authors with no connection to each other beyond the most generic of similar threads around a general topic. In some severe cases, the siloed proposal reads like disconnected journal articles published in different disciplinary journals. Siloed narratives are the geopolitical equivalent of Balkanization, whereby narrative sections inhabit the same proposal neighborhood but with sufficient privacy fencing to ensure that the narrative sections are essentially estranged rather than interdependent.

Assessing the extent to which a narrative draft is siloed is a key step in moving a proposal along the pathway from uncompetitive or unsuccessful to competitive and successful. Look for several of the tell-tale signs of the siloed proposal, some of which will likely exist in the initial draft and will need to be addressed in each subsequent draft to converge on an integrated research narrative. These signs include:

- The lack of a clearly stated vision statement that defines the goals and objectives of the proposed project and serves as the central reference point, or anchor, for each narrative component of the project description. Essentially, synergy requires a conceptual foundation that serves as the center of gravity and ***illuminates the relational framework for the key research topics***. These topics need to be defined as individual research areas and then melded by explaining their key disciplinary intersections, or research integrators, that, in turn, give rise to synergy.
 - Heuristically, this process is somewhat like the use of the Armillary sphere that originated with the ancient Greek astronomers, or the celestial globes used by the Chinese, to help visualize the relational motion of the planets and relational path of the stars, later formalized mathematically by Kepler's planetary laws. While an integrated proposal does not meet this grand scale, ***it is key to understand synergy as the relational framework among component parts rather than just a discrete explanation of each part***. It is the difference

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between having all the parts needed to build a mechanical clock and the insight into how all the parts fit and work together, the former representing a proposal that is not integrated and the latter a proposal that is integrated and achieves synergy, or in the case of the clock, accurately tells time.

- Lack of a clear and logical narrative path that binds the research goals and objectives and the underpinning hypotheses together in a way that synthesizes the research elements and clarifies how they contribute to integration.
- The absence of a clearly described interdependency of various sections of the proposal, either among the research strands or between the research section and other required sections of the proposal.
- The lack of narrative synthesis across sections, for example, explaining how one research strand enables another, or demonstrating how the research topics are dependent rather than independent activities.
- The absence of a logically ordered research plan, linked to a milestone chart, that describes the order of the research and clarifies the key points of intersection of the research components that in turn give rise to an integrated narrative.
- A draft of the proposal that contains “spare narrative parts” or sections of the research narrative that do not appear necessary for the success of the project or contribute to a better understanding of the integrative aspects of the proposed research.
- The lack of integrative visuals that serve as complementary graphical integrators to the narrative.
- The lack of clarity and the introduction of ambiguity in the research narrative, particularly assuming that what is clear to the authors will be clear to the readers.

The key takeaway, however, is that proposals that can be classified generally as “team science proposals” require a very clear and nuanced understanding of how they differ and to what extent they differ in the development and writing of the research narrative than more traditional grants to ensure the path from silos to synergy is successfully navigated and you arrive at your funding destination successfully--the grant writing equivalent of arriving at the Emerald City.