



# Hybridizing Motivational Strains: How Integrative Models Are Crucial for Advancing Motivation Science

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## Abstract

This special issue was motivated by the realization that student motivation is inherently complex and no single framework can capture it in its full richness. However, the current zeitgeist in educational psychology seems to explicitly discourage attempts at integration as researchers are incentivized to stay within their own theoretical camps. In this special issue, we asked seven research teams to revisit their theoretical assumptions and cross-fertilize their own theories with other frameworks. We also invited three distinguished luminaries to critique and comment on this undertaking. We highlighted key issues that prevent cross-fertilization of ideas across theoretical borders, surfaced potential dangers associated with naïve integration, and proffered future directions that could nudge motivation science towards a more cumulative and integrative approach.

**Keywords** Integration · Theoretical integration · Motivation science

Psychologists treat other people's theories like toothbrushes—no self-respecting person wants to use anyone else's. – Walter Mischel

## The Problem of Fragmentation

Motivation and learning are complex, and no single theory can fully capture the complexity that underlies these processes. However, within the field of motivation in educational psychology, several camps of research, each with their own theory, continue to

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conduct research, while ignoring findings and insights from other camps. How can our field be contributing towards cumulative knowledge if the research is so fractionated?

This problem or lack of theoretical integration is not new. Calls for integration have appeared with clockwork regularity in the motivational literature. We provide some examples from some of the most distinguished luminaries in our field:

...an integrated, systemic, and longitudinal perspective on these critical constructs is warranted. Only in this way can we hope to learn more about how various achievement motivation constructs may work in concert or in conflict within classrooms...Such an ambitious agenda not only requires that researchers consider alternative methodologies and diverse perspectives, but it also necessitates that motivation researchers, and those in other research communities, join forces... (Murphy & Alexander, 2000, p. 46)

Although various theoretical models are flourishing, there is a need for theoretical integration in the field...The proliferation of different terms (and measures) for similar constructs makes theoretical integration more difficult (Eccles & Wigfield, 2002, p. 127)

Having a unified theory can help us address these problems in more informed, systematic, and integrated ways. At present, we have some powerful theories, but many seem to be isolated theories explaining isolated phenomena. Because of this, we get only piecemeal glimpses of how people work and how to help them function better (Dweck, 2017, p. 689)

...there is a need for continued discussion about whether the field should be moving towards a more unified theoretical approach (Koenka, 2020, p. 2)

Given that motivation researchers carry out their scholarship using a range of theoretical perspectives, we need to critically consider whether the field truly needs so many distinct theories and constructs (Anderman, 2020, p. 1)

Perhaps it is time to ask for more research on the competing explanations, and showing how a reduced but higher order model can 'explain' and predict more about an individual's motivations... (Hattie et al., 2020, p. 7)

An important challenge for research reform is to achieve greater parsimony across theoretical frameworks...researchers should be challenged to provide clear justifications for the particular theories they cite to support their predictions, or better yet, to design studies that test the predictive utility of one theoretical explanation against another (Wentzel, 2021, p. 166)

Without effective integration, a field can experience unchecked and likely unsustainable growth in the number of theories...Excessive growth in the number of theories can hinder educational psychology's ability to generate reliable findings with practical implications, jeopardizing its reputation with practitioners, policy-makers, and the public (Greene, 2022, p. 3013)

## Why Is Integration Important?

We make two cases for integration: the first is scientific, and the second is practical. Our first contention is that a lack of theoretical integration hinders scientific progress and makes us reinvent the wheel each time.

The promise of such an integration is a more effective understanding of student motivation and learning, which are inherently complex. Perhaps Alexander and Murphy (2000) provide the strongest case for integration when they wrote, “Only in this way can we hope to learn more about how various achievement motivation constructs may work in concert or in conflict within classrooms; how learners’ motivation orientations or states are coloured or shaped by cognitive, physical, and sociocultural forces or vice versa; or how the course of motivation may change across the life span” (p. 46).

Scholars working within one theoretical tradition have become aware of this need. For example, achievement goal researchers have linked approach-avoidance motivation with mastery-performance goals (Elliot, 1999). In recent iterations of the theory, expectancy-value researchers have emphasized more strongly the situated nature of achievement motivation, renaming their theory as situated expectancy-value theory (Eccles & Wigfield, 2020). Self-determination theory has incorporated five mini-theories under its umbrella to create a more comprehensive theoretical perspective (Ryan & Deci, 2019). However, despite these attempts at integration, much of this work has been carried out within distinct theoretical traditions. This special issue is an attempt to encourage researchers to engage in cross-theoretical work.

Pioneers of cross-theoretical work include Alexander’s (2003, 2004) *Model of Domain Learning* which integrates knowledge, strategies, and interest under one theoretical umbrella; Ford and Smith’s (2007) *Thriving with Social Purpose* (TSP) model, which includes emotions, personal agency beliefs, and goals under one framework; Ford’s (1992; Ford & Nichols, 2019) expansive approach to understanding goals using *Living Systems Theory*; and the *Four-Phase Model of Interest Development*, which integrates emotion, value, and epistemological components across a potentially developmental trajectory (Hidi & Renninger, 2006; Renninger & Hidi, 2022a, b). Each of these cross-theoretical efforts has brought together widely researched psychological theories. They have sought to increase these theories’ contextual clarity and predictive/explanatory power. While they are generally well respected, and each of them has been reasonably well cited, in the face of field-wide “camp-ism,” they have generally failed to be widely adopted.

The second problem/issue associated with fragmentation is practical. Anderman (2020) asks the question of whether we need all these theories. He wrote, “From a practitioner/policymaker perspective, the answer would probably be that we do not need all these theories...The complexity and nuanced terminology across motivation theories may contribute to misconceptions about the value of this content for teachers. Whereas the proliferation of motivation constructs and theories may be beneficial for researchers, it may also serve as one of several catalysts for the elimination of our courses from teacher education programs.” Hence, our continued relevance and ability to contribute to education might also partly hinge on our efforts to undertake some form of integration.

## What Causes the Problem of Fragmentation?

We have met the enemy and he is us – Walt Kelly

Despite these repeated calls for integration and acknowledgment of the value of integration, much of the empirical research on student motivation and learning remains siloed, so one question that we need to ask is who/what is causing this problem of fragmentation?

Skinner (2023) makes the argument that it is we, researchers, who create this problem. She wrote, “fragmentation in the field is not a problem for experts; it is actually *caused* by experts—an inadvertent byproduct of many specialists working in multiple theoretical perspectives.”

One reason behind this is that of misaligned incentives. The people who will benefit most from integration will be practitioners, policymakers, graduate students, and other end-users, while those who have to undertake such work will be us, the researchers and experts.

Such territoriality does not interfere with the progress of theorists and researchers working in their respective areas, but it does create problems for anyone who wants to make sense of the field as a whole-- such as graduate students and researchers new to the field, or educators and interventionists trying to apply this work. These end-users are faced with a splintered and confusing picture of academic motivation. Students and beginning researchers can have trouble seeing the big picture...Such fragmentation also makes it difficult for interventionists to design comprehensive educational programs, and impossible for teachers and other practitioners to form comprehensible mental models of the field of student motivation as a whole

## The Special Issue

To break these theoretical borders apart and encourage creative integration, this special issue recruited strong researchers to synthesize integrative theoretical models related to individual differences in motivation and learning (i.e., theories related to motivation, emotions, strategies). We asked them to revisit their own theoretical assumptions and cross-fertilize their own theories with other theoretical frameworks. These integrative models will establish common ground for future research.

We requested that researchers address some of the questions below:

1. What happens when you cross-fertilize your chosen models/theories? What are the points of convergence and divergence? What creative synthesis results from integration?
2. What are some complementary gaps that might be addressed through an integrative synthesis of established theories?

3. How does the learning environment interface with individual differences in your integrative model?
4. Are there competing theories/models (e.g., variables/processes that do not work well in one theory but might work better in another theory), and how does your integrative model shed light on these perspectives?
5. What does your integrative model have to say about construct validity and predictive validity (i.e., overlap in constructs, how constructs meaningfully predict learning outcomes)?
6. What are the fundamental meta-theoretical, ontological, and epistemological bases of your chosen theoretical approaches? How do you reconcile them with each other?
7. What are the boundaries/boundary conditions across the theoretical models? When is it helpful to integrate or when is it helpful to stay within one theoretical model? When is integration unhelpful?

It is our hope that creative cross-fertilization of theories will confer a cumulative advantage and lead to the creation of more comprehensive frameworks. They will allow the weaknesses or gaps of one approach to be shored up by the strengths of others. We believe that each theoretical framework depicts an important part of the story, but only a part. Hence, integrative theoretical models will enable us to tell stories that, hopefully, are more complete than what we have thus far.

## The Special Issue Papers

We invited seven research teams to undertake our challenge. The first paper by Martin (2023) attempts to bridge theories of instruction with theories of motivation. He presents a two-step approach to integration that incorporates both intra-domain with inter-domain integration. In the first step, Martin conducts intra-domain integration. Within the field of motivation, the Motivation and Engagement Wheel (Martin, 2007) is presented as an example of intra-domain integration as it incorporates adaptive and maladaptive aspects of motivation and engagement. Load reduction instruction (LRI) is likewise presented as an example of intra-domain integration in the field of instruction as it integrates elements of explicit instruction with guided independent learning. In the second step, Martin drew together the two unified motivation and engagement frameworks into a “unified educational psychology framework.”

The second paper by Dinsmore et al. (2023) brings three models for explaining student learning to the forefront. It seeks to establish a Venn diagram of what the Model of Domain Learning, self-regulated learning, and approaches to learning share. At the same time, this paper seeks to establish their boundary conditions in terms of their unique contribution to learning. Building on this foundation, Dinsmore et al. meld a model that aims to “provide researchers with a more complex, dynamic way to evaluate the role of cognition in learning.”

In the third paper, Fryer and Leenknecht (2023) argued that the growth of meta-analytic and meta-meta-analytic studies has enabled the research

community to reach some form of consensus on the critical factors that shape teaching and learning. They highlighted the importance and interconnected nature of feedback, teacher clarity, and self-efficacy within teaching and learning. Drawing on key theories including Bandura's Social-Cognitive Theory, Perceived Control Theory, and the Self-System Model of Motivational Development, the article developed an integrative model demonstrating how classroom experiences might enhance self-efficacy, engagement, and learning outcomes.

The fourth paper by Hornstra and colleagues integrates high expectations theory (HET) with self-determination theory (SDT). HET focuses on the specific teacher behaviors that teachers engage in classrooms to convey high expectations, thereby creating an environment conducive to motivation and learning. SDT, on the other hand, is a more macro theory of human motivation and well-being that emphasizes the role of interpersonal contexts in nurturing motivation and well-being. Hornstra and colleagues mainly focused on "teaching practices" as both theories connect and overlap at this level. In integrating these two approaches, they proffered concrete guidance on how teachers can provide optimal learning opportunities for their students.

The fifth paper by Elliot and Sommet (2023) proffers the hierarchical model of achievement motivation as an example of theoretical integration. The hierarchical model posits that energization and direction are separate yet equally important components of motivation. Energization is about why people orient to particular stimuli, while direction serves energization by channeling it. Both constructs are needed to develop a fuller understanding of achievement motivation.

The sixth paper by Noetel et al. (2023) differs from the other papers given that it is empirical in nature. They examined the predictive role of teacher behaviors on student engagement. They test four major theories—self-determination theory, achievement goal theory, growth mindset theory, and transformational leadership theory—to determine the most critical teacher behaviors that predict changes in students' engagement. Their findings about the most critical teacher behaviors did not fit neatly within one theoretical model, demonstrating the value of integration.

The last paper by Skinner advances a "system approach" and suggests that all theories and research describe parts of the "larger motivational system" in which they are embedded. Recognizing this, an initial step towards theoretical integration is the identification of "big ideas" that are common to the field of motivation. Skinner advances four key guideposts for principled motivational integration: (1) motivational resilience (which covers the energy, direction, and durability of action), (2) academic identity (covers the many self-system processes covered in motivational theories), (3) complex social ecologies (incorporates the features of the classroom environment and meso- and macro-environmental factors), and (4) developmental embeddedness. She provides specific examples of how different motivational theories and constructs can be located within this larger motivational system and also gives concrete recommendations for teachers and practitioners to draw on insights from these four "big ideas" to improve teaching and learning.

## Commentaries

We also invited three distinguished luminaries in the field—Patricia Alexander, Reinhard Pekrun, and Richard Ryan—to comment on the SI submissions. Alexander (2024) acknowledged “the creative and insightful thinking that went into each of these articles and the invaluable contributions their authors made to the extant literature” (p. 11). She took one of the central metaphors in the SI and nuanced the distinction between hybridization and integration. She defined the goal of hybridization as seeing “parent theoretical models with distinct properties selectively combined in a manner that strengthens the motivation features, traits, or strains in the emerging specimen” (p. 2). In contrast, she notes that integration researchers seek to “produce stronger or more viable variants of existing variants” (p. 3). She notes that some papers in the SI were more akin to hybridization, while others took the path of integration. Regardless of which path they took, Alexander urged the authors to evaluate their efforts in light of the “prospective value to learning and academic development for all students” (p. 10). Alexander cautions researchers against equating learning with achievement and reminds researchers of their north star, which is the promotion of students’ learning and academic development.

Pekrun (2024) congratulates the SI authors for providing “both metatheoretical integration that organizes the conceptual space of motivation theories, and theoretical integration that merges constructs and propositions, thereby reducing unnecessary complexity and redundancy” (pp. 19–20). However, he also cautions that integration may not necessarily solve theoretical stagnation. Hence, he reminds authors of the need to attend to recent developments in neighboring fields such as cognitive science, behavioral economics, and neuroscience. He also suggests researchers consider formalizing their theories and more closely examining the tension between specificity and generalizability. He asks the question, “Why exactly should principles of motivation be the same across all persons, situations, and contexts (except for reasons of parsimony)? What exactly are the building blocks of psychological processes that are universal, and in what way can the interplay of these building blocks vary across persons and tasks?” (pp. 18–19).

Ryan (2024) commends the insightful work of the SI authors, noting, “Each of these articles represents an authoritative attempt by top scholars to expand the field of motivation in education through cross-theoretical ‘fertilization’ or, in a few cases, actual theoretical integration” (p. 1). Ryan notes that considerable progress has been made in motivation science in the 1970s and 1980s. Compared to older models which emphasize external control via contingent rewards, there is now a greater emphasis on the learner who is now “the center of our universe of inquiries” (p. 3). He also notes a key challenge facing the field, which involves a “clash between what we know as educational researchers and the policies, directives, and institutional cultures that regulate teachers’ classroom behaviors and goals” (p. 2). He cautions researchers against naïve integration and makes the injunction, “My concern is that we do not make mistake charts, figures, models, or lists of variables as constituting a theory. And when we as scholars take the idea of theories seriously we should demand a lot from them—including a fully considered and explicit meta-theory and philosophic grounding, a solid set of links between abstract constructs and empirical

data, a consistent set of priorities and aims, and the psychological sensibilities that follow from these” (p. 13).

## What Can We Do?

Despite knowing about the value of integration, a key challenge is how to undertake it in one’s own research program. We present three possible routes that researchers could consider (Gigerenzer, 2010).

### Route 1: Competition Among Theories

The first route is through competition. This is perhaps the most common route and embodies Karl Popper’s idea that scientific progress occurs best by successively eliminating theories until ideally, one survives. This approach is quite common in the natural sciences. For example, the theory of evolution was pitted against intelligent design. The geocentric model of the universe was contrasted against the heliocentric model of the universe. Kuhn (1962, 1977) posited key characteristics that provide a shared basis for the choice of theory: accuracy, consistency (internal consistency and external consistency with other currently accepted theories), scope (ability of the theory to extend beyond the data it is required to explain), simplicity (ability to organize fragmented and isolated phenomena), and fruitfulness (capacity to generate further research). However, it seems that in educational psychology, competition among theories is uncommon. As Greene, (2022, p. 3017) noted, “At some point, theory evaluation and integration should occur, where the field elevates the most just, effective, reliable, and beneficial theory, or aspects of theories, and sets the others aside. In essence, psychologists can let a thousand theory flowers bloom, but at some point, they need to decide which are the prettiest.”

Among the SI papers, perhaps, the work of Noetel et al. (2023) followed was truest to this approach. They attempted to test multiple competing theories including achievement goal theory, self-determination theory, mindset theory, and transformational leadership theory. They used predictive modeling techniques to examine which theory could best explain changes in students’ engagement. Perhaps, future researchers could also use a similar approach in comparing which theory would best predict and explain the phenomena they are interested in.

### Route 2: Formation of Unified Frameworks

This approach is the formation of unified theoretical frameworks. Dweck (2017) exemplifies this approach in her ambitious research program unifying motivation, personality, and development. To some extent, self-determination theory researchers have also created a more unified framework by integrating five mini-theories under the ambit of SDT, which include cognitive evaluation theory, organismic integration theory, causality orientations theory, basic needs theory, and goal content theory.



Alexander (2024) takes the SI's central metaphor of hybridization to refer to this process. She wrote, "In the biogenetic sciences is to create a new species with select properties of the parent organisms. Through hybridization, the desired outcomes are thus new specimens or variants that are superior to the parent organisms for select features, traits, or strains..." Pekrun (2024) refers to this process as theoretical integration, wherein researchers "reduce the number of constructs and propositions by merging them" (p. 4). Ryan (2024) argues that this process involves "a genuine synthesis of different theories or models into a coherent and internally consistent perspective... The goal is to develop a more comprehensive and robust perspective that provides a deeper understanding of the phenomenon under study and more than ad hoc findings. If integrative, such efforts supply hypotheses and formulations for new or novel problems as these arise" (p. 8).

### Route 3: Integration of Existing Theories

The third approach—and perhaps the most feasible in our field—is through the integration of existing theories. Our preference for this approach can be gleaned from our use of the word "hybrid" as a central metaphor in the SI's title. Whereas theoretical integration is often viewed as competition and survival of the fittest (i.e., Route 1), the third approach we advocate envisions growth through bridge-building. The task is to build networks between theories and detect coherence among them.

Outside psychology, a successful example of this third route is through the combination of Mendelian genetics and Darwinian theory. In the mid-nineteenth century, Charles Darwin attempted to understand the concept of inheritance through pangenesis, without having any knowledge of Gregor Mendel's research. It was only in the early 1900s, when Mendelian genetics and Darwin's theory were integrated, that scientists started comprehending the mechanisms of inheritance. This eventually led to the identification of DNA.

This third route is perhaps the most reasonable and practical in the field of educational psychology. Indeed, nearly all the SI authors took this approach. For example, Martin (2023) attempted to bridge motivation theory with instructional theories. Elliot attempted to bridge SDT and achievement goal theory, while Hornstra et al. (2023) attempted to integrate the more macro SDT with the more context-bound theory of HET. Fryer and Leenknecht (2023) integrated more general work on self-efficacy and perceived control with more specific theorizing in higher education.

### Future Directions

Having reviewed the SI papers, we also propose several avenues for future work that might move the theoretical integration enterprise forward.

## Apply the Logic of Subtraction

Product designers champion the idea of subtraction wherein one must remove an essential component of a product and find uses for the newly envisioned product. It is human tendency to add, but we find it difficult to subtract. This is inherently difficult, due to the “endowment effect” as we might imbue greater value in theories we have devoted our careers to. It takes courage to apply the logic of subtraction to our own research programs. Perhaps, we can ask ourselves whether there are constructs, models, or frameworks that can be removed or downplayed.

Are there constructs that have been consistently shown to have small effect sizes and low predictive validity? Are there variables that are redundant with other constructs, denoting jingle-jangle fallacies?

Noetel et al. (2023) provides an example of how theories and constructs could be simplified. They pitted different motivational variables against each other to identify which teacher behaviors were most predictive of changes in engagement. Meta-analytic findings can also serve as a useful resource in our attempt to identify the focal variables in motivation. Fryer and Leenknecht (2023) turned to existing meta-analytic findings to help them bring into focus the critical contextual variables that were pertinent for understanding university students’ sustained engagement and achievement.

To encourage us to do this, Anderman (2020) suggests that it might be useful to take the perspective of practitioners, interventionists, and other stakeholders who might be understandably overwhelmed by the dense terminology and fine-grained distinctions that preoccupy the research community (see also Skinner, 2023).

## Evaluate Our Theories Rigorously

Most researchers end up within a certain theoretical camp for reasons other than pure science. Perhaps our doctoral supervisors were the progenitors of the theories themselves or our doctoral committee members favored certain theoretical models over others. Perhaps, we ended up using a model or framework that is ascendant and that many of our peers are using, in what could be a manifestation of social contagion. We seldom rigorously test the heuristic value of the theories we are using. However, it might be useful to take a step back and rigorously evaluate the theories we use. To aid in “spring cleaning” the gallimaufry of motivational theories and terms, it might be helpful to evaluate the theories in terms of the following:

1. Predictive value: How much do they predict real-world outcomes?
2. Practical value: How much do they inform our end-users? What instructional/contextual factors could teachers, school leaders, or students change?
3. Explanatory value: What is the conceptual breadth of the theoretical models? Do they explain the full range of processes and outcomes that we are interested in?
4. Developmental trajectory: Learning is explicitly a developmental process that takes place across subjects and across time. How do our theories take this development into account? Most of our current theories do not provide a foundation

for developmental hypotheses. Newer analytical approaches like latent growth curve modeling, growth mixture modeling, and latent transition analyses do not have robust theories to work from. We therefore have two choices: Our current models must be updated to reflect ongoing empirical outcomes from new designs and analyses or new models must be created. Models which have development as their foundation such as the Model of Domain Learning and Four-Phase Model stand as potential examples of how this might be done (Alexander, 2003; Hidi & Renninger, 2006).

### Consider the Role of Other Relevant Disciplines

Pekrun (2024) warns that “within-discipline integration alone is not sufficient to overcome the current theoretical stagnation in the field” (p. 1). He encourages motivation researchers to consider developments in related fields and argued that “motivation science could break out of its silo by communicating with cognitive and affective scientists...” (p. 17).

Aside from cognitive and affective science, researchers could also be informed by neuroscience. One of this SI’s reviewers noted, “It is puzzling that in a paper that focuses on theory integration...no consideration is given to any relevant neuroscientific findings.” Indeed, none of the SI papers explicitly drew on neuroscientific findings. The neural basis of motivational phenomena is still poorly understood, although calls for integrating neuroscience and motivation have been repeatedly made in the past few years (Hidi, 2016; Hidi & Renninger, 2019). Interesting work is being conducted that attempts to link motivational theorizing with neuroscience (e.g., Murayama, 2022). Given that motivation is partly brain-based, perhaps, it is time for motivation researchers to also start exploring the neuroscience of motivation and what role it might play in classroom teaching and learning.

An example in science is Darwin’s theory of natural selection, which was inspired by a key idea in economics and demography. Thomas Malthus published *An Essay on the Principle of Population* wherein he argued that human populations tend to grow exponentially, which would lead to inevitable shortages, competition, and struggle for survival. When Darwin encountered this essay, he saw a parallel between Malthus’ ideas about human populations and what occurs in nature. Malthus’ ideas about population growth and competition for resources provided Darwin with an important theoretical framework for understanding the dynamics of survival and reproduction, which was crucial to his groundbreaking work on the theory of evolution by natural selection. By attending to developments in other disciplines, researchers can infuse new vigor into motivational theorizing.

### Include Both Explanation and Prediction

Psychology aims to both explain and predict human behavior. In the case of motivation theories, explanation seems to be the exclusive focus, and prediction is given a relatively short shrift.

While explanation and prediction may be compatible in theory, there are reasons to believe that they often conflict. From a statistical perspective, the model that best approximates the data-generating process may not necessarily be the most effective at predicting real-world outcomes, due to a phenomenon called overfitting. This means that a biased and implausible model can sometimes outperform a more accurate but complex model. Additionally, it is uncertain whether psychological phenomena can ultimately be simplified enough to be modeled accurately by humans. As a result, researchers must choose between developing complex models that accurately predict outcomes but do not respect known psychological or neurobiological constraints and building simple models that may be theoretically elegant but have limited predictive capacity (Hofman et al., 2021; Yarkoni & Westfall, 2017).

Researchers can carefully consider the differences in methodological approaches between explanation-focused strategies and prediction-focused strategies (e.g., King et al., 2024; Mendoza et al., 2023; Wang et al., 2023a, b). In motivational research, quantitative methods are typically used to identify causal relationships or estimate parameters that are of theoretical interest to researchers. In contrast, prediction-focused methods using machine learning are primarily designed to minimize error on new, unseen data, and as such, researchers using this paradigm evaluate their models on held-out data as a standard practice. Explanation-focused motivation researchers, on the other hand, tend to fit their models entirely in-sample, as their goal is to explain motivational processes rather than predict outcomes.

Both explanation and prediction have their strengths and weaknesses, and perhaps, there is a need to integrate both. Researchers may need to balance both an explanation-focused strategy, which seeks to uncover abstract and generalizable principles, and a prediction-focused strategy, which aims to replicate the outputs of the true data-generating process without regard for how this is accomplished. The paper by Noetel et al. (2023) shows how we can redress this imbalance through the creative use of machine learning approaches. Aside from the suggestions above, we may also need to broaden the types of research we do and change our research community's attitudes and practices. We turn to these below:

### **Increase Our Research Community's Awareness of Theoretical Integration as a Valuable Endeavor**

Perhaps another way forward is to help researchers and graduate students understand the value of integration itself. As Gigerenzer (2010, p. 733) wrote, "Whereas the unification of theories such as evolutionary theory and genetics, is a widely shared goal in physics and biology, it is barely visible in psychology. Few psychologists even consider theory integration as an objective." Perhaps, the value of theory construction and integration should be taught explicitly in our graduate programs (Borsboom et al., 2021).

Another potential solution to the problem of theoretical fragmentation is to take the perspective of the practitioner. Translational researchers may be less likely to be obsessed by our field's focus on fine-grained distinctions between different motivational constructs, variables, and frameworks, and they are more likely to hone in on

the central phenomena of interest to students, educators, and practitioners, the ultimate “end-users” of educational psychology.

### **Encourage Reviewers and Journal Editors to See Value in Integration**

The last and perhaps most important leverage point is to convince reviewers and ultimately journal editors of the value of integration. As gatekeepers of knowledge creation, journal editors will play a decisive role. If the editorial teams of our top-tier journals continue to reward only those papers demonstrating loyalty to a single theoretical camp, little will change in the way authors engage in their work. We have experienced this in our own attempts to focus on theoretical integration, as evidenced by the following reviewer comment in one of our papers attempting integration, “...the theoretical rationale is a bit muddled with reference to multiple kinds of theories. XYZ (theory) seems to be the most relevant with all the variables subsumed in this theory, but other theories are brought in, in a way that is a bit confusing to me and to the reader perhaps.” Although we could have done more to enhance the clarity of the paper, this comment shows some bias against work that draws on multiple theoretical traditions and a preference for ‘cleaner’ models that stay within one theoretical camp.

If, however, journal editors become more open to contributions that demonstrate theoretical integration and encourage this in guidelines to both authors and reviewers, then reviewers will begin to shift how they assess submissions. The authors will then be rewarded for developing theoretically integrative papers to match the shifting expectations of scholarly journals.

### **Caveats**

If the only tool you have is a hammer, it is tempting to treat everything as if it were a nail. – Abraham Maslow

Despite our call for integration, it is also important that this not be done in a haphazard manner. Careful attention to meta-theoretical assumptions and boundary conditions must be made. As Ryan (2024) noted in his commentary, “...good theories can often weather omissions of phenomena that they are not ready to assimilate, but can often collapse under the weight of swallowing too much; making assertions or including variables that are outside their integrative span” (p. 6).

Furthermore, it is important to ask whether integration is always necessary in a particular situation. Pekrun (2024) argues that theoretical integration is only one potential strategy to improve scientific understanding. Other strategies include “differentiating theories, revising theories, generating new theories, and discarding old theories” (p. 4). Integration can be pursued independently or alongside these other strategies depending on the phenomenon under investigation. Hence, it is critical that the work of integration is undertaken with considerable thought and rigor.

Integration should not just be undertaken for integration's sake. We agree with Alexander (2024) that the ultimate goal should be to promote "learning and academic development for all students" (p. 2). Education is a practical discipline, and we need multiple tools to understand and solve different problems. We will consider this SI to have been a success if it encourages researchers to broaden the set of tools that they draw on. Unfortunately, the current zeitgeist in educational psychology strongly discourages doing so, lest reviewers and editors reject works that commit sins against theoretical purity.

It is our strong belief that (at least some) educational questions and problems would certainly benefit from a more integrative and cross-theoretical approach. We applaud the authors in this SI for pointing out possible ways for how to do so.

## Conclusion

For the past few decades, most motivational researchers have used single theories. This would be akin to an engineer trying to build a bridge just using one of Newton's laws. This will ensure failure. To be successful, the engineer has to use Newton's three laws of motion as well as a broad array of other relevant physical principles. Similarly, educational psychology needs multiple constructs, models, and theories working together to promote its goals of understanding and promoting student learning and development. Integration is not only necessary for scientific progress but also essential to increasing our field's impact and our ability to provide meaningful direction to educators, practitioners, and policymakers.

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