# Introduction

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Project-based work has always been fraught with challenges and setbacks (Hirschman, 1967; Ika & Saint-Macary, 2023). No project is a long and quiet river, the adage says. As the French writer Molière wrote in *Tartuffe*, or *The Impostor* in 1664, "There's a long way from the project to the thing." We know from years of collective experience and research that projects tend to have a complicated life (or "behavior") of their own with plenty of detours, out-turns, inflection points (Williams, 2005), peripeties (Engwall & Westling, 2004), drift or dead ends (Kreiner, 2020), branching off assigned paths, going off track, zigzagging, and ending perhaps as tragedies (Bröchner, 2022) or, if one is fortunate, happily (Hirschman, 1967). Targets set may be realized anywhere but on target, from near misses to outright failures (Ika et al., 2022), as projects routinely experience "the potential for breakdown and repair" (Strauss, 1988, p. 172). As Ika et al. (2022, p. 3319) note, "projects harbor tensions between projections and plans, decisions and actions, outputs and outcomes, success criteria and success, and project *management* success and project success, the ignorance of which may be the reason why projects fail more than they succeed."

At the core of "how projects work" (Love et al., 2019a, 2019b) is a schism between the projected and the realized future (Kreiner, 2014, 2020), which may explain why projects systematically deviate from assigned plans and paths and result in far too common project management paradoxes (Ika et al., 2022). For instance, on the one hand, the development of major projects, those time-bound initiatives that are of a large-scale, inter-organizational, or complex nature, is significantly increasing, aimed at delivering economic, social, and institutional infrastructure and/or tackling grand challenges. The world's most pressing issues such as climate change, global pandemics, and unsustainable development all fall into this latter category. Between China's various "Belt and Road" initiatives, infrastructure redevelopment under "Build Back Better" funding in the US and Europe, and the huge increase in developing world projects, multi-trillion ($USD) investments are widely anticipated. On the other hand, these major projects often make headlines for the wrong reasons, due to their chronic underperformance. Typically, they suffer from a fivefold intersection of considerable delays at their completion, staggering cost overruns, dismal benefit shortfalls, painful stakeholder disappointments, and harmful sustainability outcomes (Flyvbjerg & Gardner, 2023; Ika & Saint-Macary, 2023).

The consequences of major projects failing on these criteria are well-reported; however, we hear far less about why these failures occur and what are the contingencies, especially the unanticipated events or opportunities and threats, that arise (Schutz, 1973; Strauss, 1988; Browning & Ramasesh, 2015; Ika & Saint-Macary, 2023). Evidence suggests that the development life cycle of major projects rarely follows a logical path that sophisticated planning and risk management might chart at their outset (Hirschman, 1967; Ika et al., 2022). As is often the case, many projects fail during ideation, whether through technical shortcomings, funding failures, or changes in strategic direction. Many others initially appear to show promise in their front-end phase but quickly become bogged down. The California High-Speed Rail project provides a fitting illustration. The target cost of the project, approved in 2008 and scheduled to be complete by 2020, ballooned to some $100 billion over its initial budget and it has yet to connect Los Angeles to San

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Francisco, its original objective (Shalby, 2024), as politicians struggle to salvage a fraction of value from the venture.

Still other major projects commence only to be abandoned completely or partially. Among recent examples of completely canceled projects is the decade-long and $ 10-billion Apple car project. Dubbed "Project Titan," it suffered what some of Apple's employees call "Titanic disaster," as it became clear that "Apple would never be able to sell vehicles at its expected margins, especially with the declining EV market and competitors racing to the bottom" (Hilliard, 2024). The HS2 project in the UK, a high-speed railroad that was planned to connect London and the North of England, is a further case of a partial cancellation. It was initially proposed in 2009 with an estimated cost of £37.5 billion. Since then, the project costs have spiraled out of control and the current cost estimate for the full business case is over £100 billion. In October 2023, the UK government announced that the Birmingham to Manchester leg, part of Phase 2, had been canceled, and instead, some of the money would be spent on upgrading existing infrastructure and improving connectivity between northern cities (Tetlow & Pattison, 2023).

A recurring theme in the lives of many projects is that they are delivered only after significant hiccups along the path to completion. Consider, for example, the Crossrail megaproject, in London, UK. While the project concept goes back to 1974, it has taken different out-turns and exhibited many instances of systematic deviations from plans over its lifetime. Indeed, not only was the £2.5 billion (1991 prices) project shelved in 1996, but it had to evolve in scope subsequently from a cross-London to a commuter railway, directed by a single actor to becoming a temporary alliance with the Greater London Authority, before later including, in addition to suppliers, groups of local stakeholders outside project governance boundaries. Continuing in fits and starts, the anticipated budget had reached £16 billion by 2007 (including a contingency of £5 billion) and £18 billion by 2009. Taking advantage of the concurrent recession and pressure to reduce the budget, the completion date was delayed before the project finally moved into its construction phase. After several additional adjustments, Crossrail was budgeted at £15 billion. By 2019, when, due to the coronavirus pandemic, the project had to be stopped to put in place new safety measures, the supplier costs increased by 53 percent over the 2008 forecast. Such a complicated behavior in the face of changing scope and end date, governance alterations, and shifting economic environment, explains much of its cost overruns (Gil & Fu, 2022).

It is in the context of the projects we have discussed and their persistent failure to perform or succeed as expected that the objective of this book was forged. It is to examine a fascinating, elusive, and complex phenomenon that occurs in the lifetime of major projects: the observance of project behavior in which there are systematic deviations between project initiation and execution (Ika et al., 2022). Following Schutz (1967, 1973), we consider *projecting* and *comporting* to be interrelated phenomena. Projecting, in the Schutzian sense, is a throwing forward to some *imagined* end while comporting, a term that Heidegger (1985, p. 41) made his own, is an *act* that is a directing-itself-toward some end. We take this to suggest that project delivery and project behavior are two sides of the same coin since complexity and uncertainty intervene between imagination and action, a gap that characterizes major project work (Daniel & Daniel, 2018; Love et al., 2024a, 2024b).

In this introductory chapter, we begin by explaining what project behavior is and why it matters for project management scholars and practitioners alike. Next, we review the key principles of project behavior and how they each connect to project complexity, risk, uncertainty, and performance, from both a scholarly and practical standpoint. We then provide a historical context for the different theories of project behavior before offering our typology. Finally, we will provide a summary of the chapters in the handbook and how they advance our thinking in terms of project behavior theory and practice.

## What Is Project Behavior and Why It Matters

The notion of project behavior dates back at least to the seventeenth century. In what is perhaps the

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antetype of the project management discipline (Cleland & Ireland, 2007; Winch et al., 2023), the English novelist Daniel Defoe offered an essay on projects and the "projecting age" in reference to his times in the UK in particular and Europe in general. He depicts a "project-oriented behavior," where the notion of the major project is "a vast undertaking, too big to be managed, and therefore likely enough to come to nothing" (Defoe, 1697, p. 20), and is seen, above all, as an instrument in the hands of "projectors," that is, promotors of schemes, to deliver social, cultural, political, literary, and scientific change, not always for personal gains (Maldonado, 2002; Novak, 2008).

More than three centuries later, the notion of project behavior abounds in the project management literature (Wynn et al., 2021; Ika et al., 2022). To get a sense of the interest of scholars in the notion of project behavior, we undertook a search in June 2024 using the keyword "project behavior" and generated some 4,680 results in Google Scholar. The same search in the two leading journals in the project management field yielded respectively 1,665 results for *International Journal of Project Management* and 1,060 results for *Project Management Journal*, with half of these results appearing in the last 10 years alone. This is a testament to the worldwide use of the term by scholars and practitioners.

Notably, research that seeks to understand the overall behavior of the project as a system of systems (Daniel & Daniel, 2018) or to model events, such as project completion or resource allocation behaviors, is common (Colon & Garland, 1993). Likewise, it is not rare to come across research that investigates the effects of the project manager's leadership, team management behavior (Bendoly & Swink, 2007), or other stakeholders' behaviors (Beringer et al., 2013), including project sponsors (Kloppenborg et al., 2014) on project performance, such as the escalation of commitment (Keil et al., 2000). We read often about the human behavioral aspects of those working in project settings (Slevin & Pinto, 2007; Pinto, 2022) such as normalization of deviance (Pinto, 2014), collaborative and opportunistic behaviors of contractors (Galvin et al., 2021), and optimistic and pessimistic project status reporting behavior (Kaufmann & Kock, 2023). We also come across multiple studies on behavioral decision-making in projects (Stingl & Geraldi, 2017) including the role of cognitive biases such as overconfidence (Shore, 2008), strategic misbehaviors such as lies (Flyvbjerg et al., 2002), smart heuristics (Love et al., 2024a, 2024b), and the "cognitive gear switching" of project managers between their gut-feelings and rational choice tools (Nowińska & Pedersen, 2024) in project delivery. In short, the field of project management has long plumbed the depths of work on system and human behavior when exposed to the unique challenges of the project setting, but in a larger context, what does the notion of project behavior entail and why does it matter?

## A Working Definition of Project Behavior

Project behavior remains an elusive idea that is often referenced yet very rarely delineated. For example, Söderlund (2004) suggests theories of the project should "explain and predict" project behavior without providing a clear definition of the concept. More recently, Gil and Fu (2022) trace the systematic escalation of capital costs over time to governance adaptations during the lifetime of large-scale projects, calling for a "grand model of megaproject behavior" and yet falling short of defining what this term implies. In short, we see the need to understand project challenges within the context of behavior, yet fail to follow the trail to its defining principles. Adopting a complex systems perspective and assuming that projects can take many different and complex out-turns, project behavior can be understood as a nonlinear and counterintuitive phenomenon (Williams et al., 1995; Forrester, 1997), stemming from "systemic interrelated sets of causal factors rather than tracing effects to single causes" (Williams, 2005, p. 499), making it "difficult for the human brain to predict and understand intuitively" (Daniel & Daniel, 2018, p. 193). As Cicmil et al. (2006, p. 683) write:

> The systemic models show behaviour arising from the complex interactions of the various parts of the project; they demonstrate how behaviour arises that would not be predicted from an analysis of the individual parts of the project and thus show

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> how the traditional decomposition models in some circumstances can be inadequate. The project behaviour shown in this body of work is complex and non-intuitive. It shows causal feed-back, leading to non-linear behaviour, and produces effects which can sometimes manifest themselves after significant time-delays.

In this book, following the work of Ika et al. (2022), we recognize project behavior as the study of how projects work, or develop, and along the way, take different and complex out-turns over their lifetime. To borrow the words from an early systems thinker and project behavior scholar, Albert Hirschman, the author of *Development Projects Observed*, project behavior "should go far in explaining and anticipating successes and failures, systematic veerings from pre-assigned paths, propensities toward specific difficulties, as well as opportunities for special payoffs" (Hirschman, 1967, p. 4). It is important to note, however, that this book is articulated around the behavior of project systems and their production and management subsystems as well as their interactions (Daniel & Daniel, 2018), *not* that of individuals or work groups/teams, which is often the focus of organizational behavior–orientated studies in project management (Chiocchio et al., 2015; Ika et al., 2022). Put differently, our focus is on the study of the behavior *of* projects in true system behavior and system dynamics tradition, not the behavior *in* projects in true organizational behavior tradition (Unterhitzenberger, 2021).

Project behavior research includes behavioral decision-making and action-taking. Most notably, in the face of complexity and uncertainty, we see this phenomenon as capturing, inter alia, (1) project investment decisions and critical junctures (or "forks in the road"); (2) project governance choices; (3) project execution actions from sponsors, managers, and other stakeholders; and (4) risks, complexities, and uncertainties. We also experience these behaviors as evidence of project performance, along with systematic deviations of projects from initial plans and paths, including project failures, successes, serendipities, and the shades of gray between success and failure (Ika et al., 2022). Put differently, we are more concerned with what Geraldi and Söderlund (2018) term the meso level of project studies, as we seek to understand project behavior at the level of the overall project system. The meso level forms that critical link between the individual/team (micro) level where people's skills, careers, and psychology matter and the supra organizational and societal (macro) level where the impacts of the project on strategy, policy, and society count the most. As Hirschman (1967) teaches us, project behavior is rooted in the nexus between the project's structural complexity and the sociopolitical complexity of the surrounding environment, including society at large (Ika & Söderlund, 2016).

## *Project Behavior: The Role of Projecting and Future Perfect Thinking*

Where there is a project, there is projecting, as an actor or an extension/collection of actors (for example, a group of stakeholders or an organization or even a society), "project" a future and uncertain situation and, in so doing, give meaning to the project to be accomplished. Put differently, there is no project without the intent or motive of a project actor or Defoe's projector (Schutz, 1967; Boutinet, 2005). When project actors seek to "make the uncertainty attached to the future something that can be dealt with in advance of it occurring," the projected future is imagined as if it were already a reality that they may look back on and imagine the steps that will have taken them there, using what has been termed a "future perfect strategy" (Pitsis et al., 2003, p. 574). As Schutz (1967, p. 61) advances, the future perfect is the cognitive process by which

> an actor projects his actions as if it were already over and done with and lying in the past …. Strangely enough, therefore, because it is pictured as completed, the planned act bears the temporal character of pastness …. The fact that it is thus pictured as if it were simultaneously past and future can be taken care of by saying that it is thought of in the future perfect tense.

Thus, future perfect thinking carries an "in-order-to" motive for action inherent with the projected future or what Schutz (1967) terms *protention* (that is, the forward-looking projection of the future).

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Protention is experienced by the project actor as a feeling or a sense of what comes next, as opposed to a "because" motive for behavior inherent with what Schutz (1967) calls *retention*, which is a perception of the past. The realized future will be fundamentally different from the projected future. Indeed, the projected future forms what the philosopher Ryle (2000) calls a course of action, which, out of many alternatives available to the project actor, provides meaning and significance to the particular action that the project actor will take in a particular situation that is fraught with uncertainty (Kreiner, 2014, 2020). Uncertainty implies that project-based work remains a process of filling in empty horizons (Schutz, 1973), as abstract protention only shows the direction of travel, not the journey whose steps need to be taken (Winch & Sergeeva, 2022), based on experiences of how a course of action will typically develop. As Schutz (1973, p. 69) notes: "Projecting like any other anticipation carries along its empty horizons which will be filled in merely by the materialization of the anticipated event. This constitutes the intrinsic uncertainty of all forms of projecting."

### *Project Behavior versus Project Actor Behavior and Action*

According to Schutz (1967), the project is a quintessential unit of action. However, in contrast to Heidegger (1962, p. 185) who argues that "projecting has nothing to do with comporting oneself towards a plan that has been thought out," Schutz (1967) believes that projecting and comporting are different yet interrelated phenomena. That is, there is a recursive relation between the action and the behavior of a project actor (Winch & Sergeeva, 2022). According to Schutz (1967) and in contrast to Weber (1978) who suggests action is meaningful behavior, what distinguishes action from behavior is the presence of a project "more or less implicitly preconceived" (p. 59) or that "action is the execution of a projected act" (p. 61). As Schutz (1967, p. 60) adds: "What is projected is an act, which is the goal of an action and which is brought into being by an action." For example, a project actor (e.g., Steve Jobs) can take the action of launching a project (e.g., the original iPhone project) through a formal kick-start meeting. Such a forward-looking human activity (Winch & Sergeeva, 2022) is thus ordered under a corresponding projected act (e.g., to conquer the world's smartphone market), which provides it with meaning. Therefore, a difference exists between the action, considered as something in progress, and the completed act, considered as something already achieved (Schutz, 1967).

In contrast, the behavior of the project actor is oriented toward the present and the past (Winch & Sergeeva, 2022); it may, for example, be unintentionally optimistic about the prospect of the project but intentionally aggressive about the project schedule and its time-to-market choice. Put differently, the behavior of the project actor may be both deliberate and unintentional. A projected act, for its part, involves a chain of coordinated actions, which collectively shed light on the lived experience of leading the project or what Cicmil et al. (2006) call the actuality of the project, whether it is completed or imagined as already over. Both actions and acts are thus mediated by the project actor in a particular situation (Schutz, 1967).

For example, Steve Jobs' request to change the screen of the iPhone from plastic to glass to avoid it getting scratched was a projected act. This was not possible without a chain of coordinated actions, including testing all the glass options on the market; convincing Wendell Weeks, CEO of Corning Inc., a NewYork–based manufacturer of special glass to have that company produce the scratch-resistant glass within six months and finally delivering it just a few days before the iPhone went on sale (Amil, 2022). As the iPhone screen example and Steve Jobs' leadership suggest, the project actor's action tends to be social "insofar as its subjective meaning takes account of the behavior of others and is thereby oriented in its course" (see Weber 1978, p. 4). Likewise, project behavior is always social. Observed project behavior may be deliberately intended, as in the project actor intentionally manipulating project forecasts to gain project approval, or unintentional as in a project being late and over budget because of the unforeseen COVID-19 contingency that has impeded its execution, a socially constructed

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category, the legitimacy of which all can apprehend.

At this juncture, however, we hasten to note that project behavior collectively concerns the past, present, and future. Past strategic decisions and actions led to commitment to the project; present day mundane managerial decisions inform the project as to what information to share in a meeting as well as actions in sharing that information in a certain manner during the project's course, and the future will depend on the decisions and actions to be taken that lead to project completion and termination. At all stages in this unfolding, much attention to events will occur. Events might mean the departure of the project manager or a change in the competitive environment, or what is subsequently seen as managerial inaction and indecisiveness. One might argue that while the project actor may take action, the project as whole, strictly speaking, cannot because it lacks human agency (Emirbayer & Mische, 1998; Winch & Sergeeva, 2022). We, however, argue that both the project actor and the project as a whole may behave. Put differently, while the project may be anthropomorphized, project behavior is predicated on both the behavior of the project as a thing and the behavior of the project as actors. Indeed, the project is more than a thing since the actors are what makes the project (Ika & Saint-Macary, 2023). As the French philosopher and anthropologist Bruno Latour's actor-network theory teaches us, the project may even act as a nonhuman actor, with significant consequences such as delays in that a tunnel boring machine may get stuck in a hole and it may take months if not years to release it through creative problem-solving, as was the case in the Hoosac Tunnel project in the US.

## *Deviations from the Planned Behavior over Time*

In the context of major projects, project organizing remains a deliberate, social activity in which projects are consciously, professionally, and skillfully designed, planned, executed, and evaluated and the projection of the future is rationally operationalized in terms of project goals and performance targets (Kreiner, 2014; Ika & Saint-Macary, 2023). In this instance, there is no project without a project actor – say a client or some other funder – deciding to commit to the project, which is seen as a reasoned and purposive human action. The premises under which this decision is made will generally inform how the project should be delivered, at least from a rational standpoint, and the project planning process predetermines and anticipates the future situations the project will face (e.g., think about a risk register) (Kreiner, 2014, 2020).

As Ika and Saint-Macary (2023, p. 210) write about major project delivery in a professional setting, "The way the project is structured, as well as the decisions and actions, must be based on reason and logic, not on personal experience or emotion." Thus, the project plan, which helps rationally reduce complexity and serves as a road map (Ika & Saint-Macary, 2023), offers a purposive action meaning and specifies such action in time and space, making specifications, deliverables, schedules, and budgets, etc. inherent aspects of the project planning process. However, since major projects are systems of designed and planned action, these decisions and the project delivery conditions they entail do *not* determine the subsequent project management process. Tasks, conducted under uncertainty, do not just adhere to the plan, as rational project management perspectives would have it (Kreiner, 2014, 2020). "Plans may be poor descriptions of actions that are actually carried out, but they are nevertheless important as providing 'space' for action. Plans thus carry a symbolic meaning" (Lundin & Söderholm, 1995, p. 448).

As Ika and Saint-Macary (2023) note, the project delivery does not happen *in vitro*, that is, within the closed environment of a laboratory, but instead *in vivo* and *in situ*. In other words, delivery is heavily dependent on context, with many actors involved inside and outside the project structure. Further, taking inspiration from Schutz (1967), we know that purposive action implies that both means and ends are always temporally in flux, marked by high degrees of indeterminacy. Thus, over time, things happen in a project and contingencies or events are bound to occur that defy the oft-flawed plan (Ika et al., 2024). There is a schism between meaning (as a multidirectional compass)

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and plan (as a road map); consequently, the emergent behavior may not be the planned behavior of the project, as complexity theory teaches us (Kreiner, 2020; Ika & Saint-Macary, 2023). As the Canadian strategic management author Henry Mintzberg argues, it's even all about the emergent behavior. As a result, when aspiration collides with political realities, as in the case of the original hopes for the UK's HS2 rail line versus its final adjudication, evidence of this schism is most profoundly observed.

When, over time, these deviations from plan and targets happen or when discrepancies exist between outcomes and anticipations – that is, emergent project behavior deviates from planned project behavior – then actors are quick to suggest there was poor planning and/or poor implementation of the plan or there were underperformances or failures in terms of the project management process or in terms of the project's long-term goals (Kreiner, 2014). Indeed, the disconnect between project *management* success and project *success* where the project may be delivered on time and/or within budget and yet fails to deliver expected outcomes (Ika & Pinto, 2022) can be explained by contingencies or environmental events that occur during a project's life cycle and are often beyond the project team (Pinto & Slevin, 1988). These events may be external – including the market and technology – and internal – including personnel changes such as team turnover or replacing the project manager – (Kunisch et al., 2017; Ika et al., 2024). As Kreiner (2014) argues, when these events occur and the plan is not on par with reality, project actors experience the drama that represents "the gap between living forward with flawed foresight and understanding backward with equally flawed but mischievously seductive hindsight" (Weick 1999, p. 134).

Indeed, time is at the core of project organizing, behavior, and performance (Lindkvist et al., 1998; Ika et al., 2024). Additionally, there exists a clear expectation of "institutionalized termination" for projects (Lundin & Söderholm, 1995) and thus a preset deadline (Lindkvist et al., 1998) in any project. However, time is woven into project performance factors such as events and processes that may affect the delivery of short-term project outputs and long-term project benefits (Ika & Saint-Macary, 2023). In response to such events, project actors may apply changes to the project over time and, in so doing, recognize windows of opportunities or favorable periods of time for the adaptation of the project to its environment (Kunisch et al., 2017; Ika et al., 2024). They may thus select the appropriate timing, pace, or speed to deliver success in the project (Shenhar & Dvir, 2007). Again, in practical terms, a key project sponsor may conduct an environmental scan that shows a lessening of stakeholder support for a pet project, necessitating the decision to delay the project until additional support can be garnered.

Project actors interact differently with the past, present, and future and may have different time horizons. For example, some may bring to the project experiences from previous interactions and expectations of potential collaborations, as they derive lessons from the performance of past projects to deal with the challenges of the present project and seek to trigger funding for the next project (Vaagaasar et al., 2020). While some project actors (such as project managers) may have a short-term concern for the delivery of the project within budget, others (such as project funders) may have a longer-term concern for the delivery of project benefits (Meredith & Zwikael, 2019). Hence, there may be tensions between different actors' temporal orientations and horizons, prompting a need to change or balance the prevailing temporal structures, such as schedules, event-based targets, or cultural norms pertaining to the extent to which a project may, for example, exceed a budget target (Vaagaasar et al., 2020). As well, there are tensions between short-term and long-term project performance, illustrating the paradox of intertemporal choice (Slawinski & Bansal, 2015), where what is best in the short term (e.g., to deliver a project within budget) may not be ideal in the long term (e.g., to deliver socioecological value) (Ika et al., 2024). This is notably the case of grand challenges, with their fuzzy goals, long-term value focus, and the pressing need for project behavior theory and practice to make the world a better place where no one is left behind (Ika & Munro, 2022).

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Tapping into their agency and thus reacting to the fuzziness inherent with major projects (Ika & Saint-Macary, 2023), actors would strive to alter, through action, the project's strategy (Shenhar & Dvir, 2007), governance (Ika et al., 2024), plan (Dvir & Lechler, 2004), and scope (Love et al., 2019a). They are compelled to strategically respond to changing threats and opportunities (Kunisch et al., 2017), as well as luck, good or bad (Ika, 2018), and in doing so, they shape the emergent project behavior. Due to the important role that contingencies (including chance, happenstance, and unintended consequences) play in shaping the project, success and failure are intertwined in meaning and action and project behavior does not have a linear relationship with project performance (Hirschman, 1967; Ika et al., 2022).

Project success and failure thus become social constructions and as such involve, throughout the project life cycle, individual and collective symbolic and rhetorical evaluations and attributions of project performance by project actors, which may not have much to do with the delivery of the project within constraints of time, cost, and quality (Kreiner, 2014; Ika & Pinto, 2022). Yet, as practice would have it:

> In project management, our assessment of success is mainly based on criteria set in the beginning (ex ante) to measure results at the end (ex post). This approach is a slippery slope since it can result in what psychosocial theorists call a *fundamental attribution error*. It leads us to assess success using subjective assessments of what we observe while ignoring external and contextual factors that occur or fall outside our purview. (Ika & Saint-Macary, 2023, p. 151)

In so doing, we blame any deviations from plans and targets on the project team actors and underestimate the role of complexity and uncertainty in projects (Kreiner, 2014). As we learn from attribution theory (Ross, 1977), there is a pervasive tendency to underestimate the influence of context on behavior. Project behavior theories may fall foul to such attribution error and thus they "may at best represent attribution errors about project performance." (Ika et al., 2022, p. 3323) Table I.1 provides a synopsis of some of the key concepts of project behavior.

## A Family of Five Principles of Project Behavior

Recent years have witnessed a conversation about two competing principles of project behavior: Daniel Kahneman's *Planning Fallacy* and Albert Hirschman's *Hiding Hand* (Hirschman, 1967; Kahneman, 2011; Flyvbjerg, 2016; Ika, 2018) (see Table I.2 for examples and read Chapters 1 and 2 of this book for ample discussion).

The Planning Fallacy, supporting belief in the tendency for projects to over-promise and underdeliver, suggests that forecasts of project schedules, costs, and benefits are by and large unrealistically close to best-case-scenarios (Kahneman, 2011). According to Planning Fallacy proponents (Flyvbjerg & Gardner, 2023), systematic biases, such as optimism bias, and misbehaviors, such as strategic misrepresentation, creep into how projects are selected, managed, and reported on. Optimism bias is the belief that decision-makers are less likely to face risks than statistical judgment warrants. Strategic misrepresentation stands for the deliberate manipulation of cost and benefit estimates, typically intended to paint a rosier picture than true estimates might warrant, in the belief that it is better to get a project started and later "beg for forgiveness" than submit real expected cost numbers that could kill the project at the outset. Psychology and power thus combine to explain the dreadful underperformance of entire classes of projects, including mega dams, rail and infrastructure, Information Technology, and Olympic Games. So resonant are the warnings of Planning Fallacy champions that public sector decision-making has been significantly affected; for example, the requirement in some UK government departments that all new project proposals be subjected to a "reference class multiplier" for cost estimation or the 2016 decision by Virginia Raggi, mayor of Rome, to withdraw her city's bid to host the 2024 Olympics, citing historical evidence of huge cost overruns. In these and other ways, it is clear that Planning Fallacy supporters have created a hugely influential perspective that is guiding both decision-makers and project management researchers.

A competing perspective known as the Hiding Hand, however, suggests that this propensity for

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**Table I.1 Project behavior: Definitional concepts**

| Key concepts | Definitions |
|---|---|
| Projecting | The looking-forward process, where an actor or an extent of actor, say a group of stakeholders or an organization or even a society, gives meaning to the project to be accomplished and, in so doing, "projects" themselves into a future situation where uncertainty almost always looms large (Defoe, 1697; Boutinet, 2005). |
| Projected future | The imagined desirable situation or anticipated state of affairs that is lying in store through purposive action (Schutz, 1967). |
| Future perfect | The cognitive process by which "an actor projects his actions as if it were already over and done with and lying in the past" (Schutz, 1967, p. 61). |
| Protention | The forward-looking projection of the future or the "cognitive process of looking towards the future" (Winch & Sergeeva, 2022, p. 49). |
| Retention | The backward-looking visualization of the past or "cognitive process of drawing on past experience" (Winch & Sergeeva, 2022, p. 49). |
| Decision | A conscious judgment or choice for a course of action out of many alternatives (e.g., Brunsson, 1982). |
| Action (of an actor) | A forward-looking human activity or "the execution of a projected act" (Schutz 1967, p. 61). It is "orientated towards the future by protention" (Winch & Sergeeva, p. 49). |
| Act (of an actor) | That "which is the goal of an action and which is brought into being by an action" Schutz (1967, p. 60). |
| Behavior (of an actor) | Consists in "human activity orientated towards the present and past by retention" (Winch & Sergeeva, 2022, p. 49). |
| Filling in | "The delivery process of working towards the desired future state as the lived experience of projecting" (Winch & Sergeeva, 2022, p. 49). |
| Project behavior | The study of how projects work, or develop, and along the way, take different and complex outturns over their lifetime (Ika et al., 2022). It "should go far in explaining and anticipating successes and failures, systematic veerings from pre-assigned paths, propensities toward specific difficulties, as well as opportunities for special payoffs" (Hirschman, 1967, p. 4). |
| Human agency | It is "the temporally constructed engagement by actors of different structural environments – the temporal-relational contexts of action – which, through the interplay of habit, imagination, and judgment, both reproduces and transforms those structures in interactive response to the problems posed by changing historical situations" (Emirbayer & Mische, 1998, p. 970). |
| The fundamental attribution error | "The tendency for attributors to underestimate the impact of situational factors and to overestimate the role of dispositional factors in controlling behavior" (Ross, 1977, p. 183). |
| Complexity | A property of a project that consists of many varied parts with a multitude of existing and emerging interrelations, which make it difficult to understand, foresee, and control its overall behavior, even when there is enough information (Vidal et al., 2011). |
| Risk | A situation where the exhaustive and mutually exclusive set of future states of the world (that is, *all* relevant alternatives) and all their consequences and probabilities are known for sure (Knight, 1921; Gigerenzer, 2020). |
| Uncertainty | A situation where *some* of the alternatives, consequences and probabilities are unknown (Knight, 1921; Gigerenzer, 2020). |

promoters to overestimate the benefits and underestimate the costs and difficulties of their assigned projects is not always bad, as creativity may come to the rescue in unforeseen circumstances (Hirschman, 1967). In other words, Hiding Hand proponents (Ika & Saint-Macary, 2023) suggest that data arguing that most projects are "dead on arrival" due to systemic errors in initial estimation coupled with willful misrepresentation, as argued in the Planning Fallacy, grossly over-represents this position, arguing that such premeditated culpability is simply one potential source of project

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**Table I.2 Three prevailing principles of project behavior: Illustrations**

| Key principles of project behavior | Illustrations |
|---|---|
| Hiding Hand | The Rideau Canal: A near miss<br>In 1826 in Canada, the Rideau Canal was envisioned as a navigable waterway from the Ottawa River to Kingston, with the goal to provide a safe supply and communication route. The project, however, took six years to complete, had a final cost of £822,000 (some 115 million in today's pounds) as opposed to an initial budget of £576,757 (about 72 million in today's pounds), and experienced significant setbacks. Faced with the stringent challenge to build not only locks but water control dams, the project team still dug deep into their creativity and found unplanned ways to deliver the canal (Ika & Söderlund, 2016).<br><br>Looking back, if Colonel By and other promoters had known about the difficulties they would encounter, they would have most likely never done the project. But had it not been built, it would not have been an engineering marvel or the successful recreational waterway that it has become over decades. As Ika (2018, p. 371) suggests: "This is an example of how ignorance and poor planning can make decision-makers low-ball the real costs and challenges of a project, and heavily understate their own creativity to overcome project-related problems." This kind of happy ending is what Hirschman (1967) describes in what he calls the Principle of the Hiding Hand. |
| Planning Fallacy | The A 380: A flop<br>In 2000, the A380 superjumbo jet project was proposed by Airbus to compete with the Boeing 747 at a budget of about $10 billion. However, the double-decker passenger aircraft of 600–800 seats turned out to be an implementation nightmare, as it struggled with massive electrical wiring problems, paid over $6 billion of penalties due to delivery delays, and had CEOs leaving a company forced to restructure. After a few postponed releases, it was delivered to its launch customer in 2007, with billions of cost overruns. Despite the $25 billion plane project being the largest passenger plane ever built, Airbus was forced to announce the end of production in 2021, as it hoped to sell as many as 750 but actually reached about a third of that target (Prisco, 2020).<br><br>Looking back, the A380 project was plagued by optimism bias on the part of its promoters, leading them to underestimate its times, costs, risks, and benefits. With the benefit of hindsight, the project should never have been started, at least according to some close observers, since it was too big for a market that was already turning from a "hub and spoke" model to embrace "point to point" travel. As Flyvbjerg (2016, p. 176) notes, "the average project is in fact undermined by a double whammy of substantial cost hikes compounded by substantial benefits shortfalls." This sort of fiasco illustrates what Kahneman (2011) coins the Planning Fallacy. |
| The Fifth Hand | The Aurora VA Hospital: Shades of gray between success and failure<br>In 2011, the Aurora VA Hospital project in the US was pegged at a budget of $678 million to deliver a state-of-the-art facility to treat up to 400,000 veterans suffering from various disabilities. Despite scope changes to cut costs and a change in contractor to put it back on track, the project ballooned to $2 billion at its formal ribbon-cutting ceremony in 2018, years behind schedule. Additional millions had to be spent three years after "completion" to fix a litany of quality issues, making the hospital one of the most expensive health facilities in the world. The project was also the site of a legal battle between the Department of Veterans Affairs and its primary construction contractor. While the Congressional Budget Office argued that unbridled optimism coupled with willful concealment of costs explain the project's underperformance, contractors suggested the snowballing of errors including a deficient collaboration among key stakeholders were the real culprits.<br><br>In hindsight, the project drift was due to a perfect storm of optimism bias and a litany of errors. As Ika et al. (2023, pp. 68 and 70) write, "The checkered and controversial history of the development of the VA Aurora hospital (Colorado) illustrates the critical nature of creating a means for satisfying the bias versus error debate . . . we can see elements of both bias and error at play." This kind of joint bias *and* error project behavior is typical of what Ika et al. (2022) call the Fifth Hand principle, which combines elements of the Planning Fallacy and the Hiding Hand to explain project underperformance under uncertainty. |

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failure but does not consider how initial miscues may actually unexpectedly spur creativity and make projects turn into success. This is the case of many UNESCO world heritage sites or other great engineering feats of the modern world such as the Hoosac Tunnel in the US and the Sydney Opera House in Australia. Clearly, these projects would not have been undertaken if their promoters had known the real costs and difficulties that they would confront. In other words, cost-benefit analysis, as recommended by Planning Fallacy proponents, could have ended up costing the world a great deal indeed.

A debate has thus emerged in the project management literature over whether the Planning Fallacy outweighs the Hiding Hand or whether bias (e.g., optimism bias) trumps error (e.g., scope changes, complexity, and uncertainty) as the most likely explanations of project underperformance (Flyvbjerg et al., 2002; Flyvbjerg, 2016; Ika, 2018; Love et al., 2019a, 2019b). As competing theories of cost overruns and benefit shortfalls, these views shape much of the debate on project planning; to wit, are decision-makers deliberately (or even subconsciously) prone to misbehaviors and biases at the outset (leading to poor project outcomes) or do simple planning and execution errors account for most project underperformance? Readers can quickly understand how this debate about project behavior is important when it comes to best curbing project underperformance, either through applying "bias uplifts" or "best practices." Because the presumed cause of underperformance is quite different, adherents to each school of thought promote very different (and potentially expensive or unhelpful) solutions to project delivery and governance. Yet, while some headway has been made in the debate, we still do not know in what circumstances the principles of behavior such as the Hiding Hand and the Planning Fallacy work and how project actors can deal with complex outturns during the lifetime of their assigned projects (Love et al., 2019a, 2019b). As it has been shown that the protagonists of the debate (e.g., Flyvbjerg *versus* Ika/Love and Kahneman *versus* Hirschman) hold antagonistic worldviews about projects and project management (Kreiner, 2020; Ika et al., 2022), one of the goals of this handbook is to examine this debate through the perspectives of different scholars and different schools of thought and address these outstanding questions from both a theoretical and practical perspective.

Two additional project behavior principles, lesser known in the project management literature, have been added for a total of four, including: (1) the Hiding Hand or Benevolent Hand, (2) the Planning Fallacy or Malevolent Hand, (3) the Passive Hand (which leads decision-makers to stifle creativity and avoid risks), and (4) the Protecting Hand or precautionary principle (which tackles ignorance through risk management and scenario-planning). Put differently, the twin principles of the Hiding Hand and the Malevolent Hand are part of a family of *Four Hands* (Anheier, 2017).

Each of these four principles of behavior is associated with the forward-looking appreciation of the complexity (e.g., underestimation or overestimation) and uncertainty (e.g., ignorance or awareness) of the project, which are common features of major projects (Browning & Ramasesh, 2015; Ika & Saint-Macary, 2023). As we learn from Anheier (2017), the Hiding Hand, the equivalent of the Apollo mission's "Houston, we have a problem here," emerges as a result of the combination of ignorance and underestimation of complexity, whereas the Malevolent Hand is the product of the combination of an awareness of full knowledge and willful underestimation of project complexity. The Protecting Hand appears to be at work when there is concomitantly an awareness of a lack of full knowledge and an overestimation of complexity. The Passive Hand is about overestimation of project complexity when the state of knowledge is such that few unknowns should come as a surprise.

While these four principles of project behavior offer superior explanation for project underperformance, they fail to account for the shades of gray between success and failure or between optimism and pessimism. Therefore, Ika et al. (2022) propose the Fifth Hand principle of project behavior, which offers a pluralistic approach to understanding major project cost overruns and benefit shortfalls by combining elements and assumptions embedded both in the Planning Fallacy and the Hiding Hand and recognizing that effective

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diagnosis of underperformance requires a willingness to accept the existence of multiple causes, both bias and error (see Table I.2 for illustration) (Pinto, 2023). The Barcelona 1992 Olympics also offers a mix of both the Hiding Hand and the Planning Fallacy as strategic misrepresentation about the capacity of the Olympic stadium occurred (strategic overoptimism) and yet optimism bias (sincere overoptimism) also triggered enough creativity to turn the project into a success in the end. As Casellas and Lehtonen (2024, p. 7) write: "For the megaproject literature, the Barcelona case demonstrates that sincere and strategic overoptimism operated in tandem, and that the distinction between the 'Hands' is not necessarily the most important aspect."

## Theories of Project Behavior: A Brief Historical Context and Underlying Assumptions

As we have seen, project behavior captures complex out-turns during the course of the project along with initial decisions and actions, events and emerging decisions and actions, and inaction and indecisiveness (March, 1994; Stingl & Geraldi, 2021). While there may be "decisions without actions and actions without decisions" (Brunsson, 1982, p. 32) as in the case of the iPhone project where the action of producing the scratch-resistant screen was taken by Corning CEO Wendell Weeks before a decision was made (Amil, 2022), the project behavior literature has primarily focused on decisions.

As projects require a wide variety of decisions (Stingl & Geraldi, 2017, 2021), historically, project management techniques, as taught in universities and training programs, have focused on the use of myriad decision-making tools. These tools include: (1) direct evaluation techniques such as checklists; (2) deterministic criteria-based evaluation techniques such as weighted scoring models, Analytic Hierarchy Process (AHP), Choosing By Advantages (CBA), and financial models such as cost-benefit analysis, net present value (NPV), and internal rate of return (IRR); (3) stochastic criteria-based evaluation techniques such as decision trees and risk-based profitability analysis; (4) deterministic planning techniques such as decision gates, Work Breakdown Structure (WBS), and CPM; and (5) stochastic planning techniques such as expected monetary value, risk sensitivity analysis, and PERT. Most of these techniques, we note, have been devised in the nineteenth and twentieth centuries to tame the projected future (Rolstadås et al., 2015). In short, our longtime focus was on developing and promoting the use of these toolkits as a means for aiding managers in their organizational and decision-making challenges when running projects.

As decision-making under conditions of perfect or near-perfect certainty is nearly impossible to come by (Kahneman, 2011), the project behavior literature has increasingly focused on decision-making under risk; that is, a context where, according to Knight (1921), an individual making a choice knows the potential outcomes of each available option and their probabilities of occurrence (see Table I.1). As such, project behavior under risk is dominated by probability logic. For example, Reference Class Forecasting (RCF), which is a widely used method to curb cost overruns, is a technique of predicting the future or the likely outcome of a purposive action, based on the forecast error of similar past actions; that is, the discrepancy between their projected costs and their actual costs. In constructing confidence intervals for future project costs based on historical performance of projects within the similar reference class, the technique is based on the probability distribution of expected, "true" costs (Lovallo & Kahneman, 2003; Flyvbjerg, 2006).

The above-mentioned original stream of project behavior research is grounded in the economics literature, which sought to understand individuals' preferences in games of chance (Kahneman, 2011). Bernoulli (1738) proposed expected utility theory where he demonstrated how individuals do not choose the available option with the highest expected value of an outcome but instead the expected utility of an action or the sum of the products of the utilities and probabilities for each of the outcomes that could result from the decision. The key question remains: How should individuals choose an action from a set of possible actions?

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von Neumann and Morgenstern (1944) then derived a number of decision-making axioms that posit that rational individuals should choose the available option with the highest expected utility theory, which represents the rational choice.

As the theory goes, to maximize their expected utility, the decision-maker needs to know the exhaustive and mutually exclusive set of actions and their future outcomes and probabilities. As is often the case, this theory evolved over time. As Gigerenzer (2020, p. 1370) remarks: "This basic theory has been modified in many ways, such as in prospect theory, and the learning of probabilities has been modified by Bayes' rule." Despite its widespread appeal, the expected utility theory came under attack in economics for its ill-suited computations, its underlying assumption of perfect knowledge about the exhaustive sets of actions and future outcomes, and lack of evidence for the existence of its stable utility functions (Gigerenzer, 2020). Over time, however, expected utility theory and its variants such as prospect theory, provided the rational prescriptions on which much of the descriptive literature on decision-making under risk in the management field is based (Holmes et al., 2011).

Expected utility theory remains a powerful explanation of project behavior. We can point to two examples to make this point in the project management field. First, as Michele Alacevich, a historian of the World Bank, writes, cost-benefit analysis, a premier project appraisal tool, offers an interesting illustration of these rational prescriptions:

> Cost-benefit analysis had been taking shape in the 1920s as a technique in water-resources development, cultivated mostly by engineers, which subjected public investment decisions to economic analysis and evaluated alternative projects in terms of the maximization of public "utility." It received a further stimulus during the 1930s expansion of public investment activity in the United States, especially thanks to the Flood Control Act of 1936, which dictated that only projects whose benefits were projected to exceed their costs could receive federal funds. (Alacevich, 2014, p. 160)

Second, Piney (2003) provides an application of expected utility theory to project risk management. The author discusses the shortcomings of applying expected monetary value as a tool for assessing and mitigating risks and presents an alternative based on the subjective view of stakeholders (the "utility function") to explain project behavior.

It is against the rational prescriptions of decision-making under risk and in particular tools such as cost-benefit analysis that the principle of the Hiding Hand (Hirschman, 1967), "a theory" of behavior at the project level, was developed. As Alacevich (2014, p. 160) notes:

> Hirschman had already shown doubts about the accuracy of cost-benefit analysis in his preliminary work for the Bank. In that specific case, however, Hirschman seemed more concerned about the possible inhibitory role of cost-benefit analysis than about its role as ex post justification: "were costs underestimated as is frequently the case? If so, was this error matched by an underestimate of benefits (also frequent) so that the Bank's judgment of the actually experienced cost-benefit ratio would have been poorer if just its cost estimate had been more nearly correct?"

Ironically, the Hiding Hand had long been unrecognized and uncredited in the project management literature, with only a few exceptions (e.g., Ika & Söderlund, 2016). Scholars in the meantime had turned to two alternative theories to expected utility theory to explain risk-related behaviors while departing from many of the theory's rational prescriptions: the theory of temporary organizations (Lundin & Söderholm, 1995) and the Planning Fallacy principle (for management, see Kahneman & Tversky, 1977 and Lovallo & Kahneman, 2003 and for project management, see Flyvbjerg, 2006, 2016). Both the theory of temporary organizations and the Planning Fallacy principle form part of the behavioral decision theory literature in project management that directly challenges the precepts of expected utility theory (Holmes et al., 2011; Stingl & Geraldi, 2017).

Lundin and Söderholm's (1995) theory of temporary organizations also helps us understand project behavior – how and why things happen – and its wider implications on creativity, learning, and innovation throughout the project life cycle (Geraldi & Söderlund, 2018). The theory of temporary organizations is inspired by the behavioral

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theory of the firm (March & Simon, 1958; Cyert & March, 1963) but it differs as it is an action-based, not decision-based, theory, or as the authors put it: "There may not be any logical connection between decisions and actions" (Lundin & Söderholm, 1995, p. 438). The behavioral theory of the firm, which operates at the organizational level, not at the individual level as does expected utility theory, posits that bounded rationality prevails because humans are limited in accessing, processing, and using information (Simon, 1955, 1957); this theory provides a detailed account of decision-making processes in organizations, which may compare their performance to aspiration levels, thereby shaping their risk-taking preferences (Holmes et al., 2011).

For its part, the Planning Fallacy principle, which sheds light on the behavior of projects where underestimation of costs and overestimation of benefits prevail, is based on prospect theory (see Kahneman & Tversky, 1979 and Tversky & Kahneman, 1992 for management and Ika et al., 2022 and Chapter 1 in this book for project management). As Ika et al. (2022, p. 3310) write: "Under the banner of prospect theory, the Planning Fallacy emerges as a phenomenon whereby planners and managers display optimism bias during the framing and valuation phases of projects. The upshot is the tendency for forecasts of project times, costs, and benefits to be close to best-case scenarios." Prospect theory is not a normative theory like expected utility. Rather, it relaxes the assumption of logical rationality of people in favor of their bounded rationality and emphasizes the role that the latter plays in their decision-making. Prospect theory, which offers a unified theory of individual risk taking, was developed in the context of controlled experiments where individual choices between alternatives are assessed, each of which involves potential outcomes and their respective probabilities of occurrence. As such, though the Planning Fallacy is assumed to be working at the project level, its underlying prospect theory operates at the individual level of decision-making and explains if not predicts decisions under risk (Holmes et al., 2011).

The Fifth Hand, which we earlier discussed, also operates at the project level (Ika et al., 2022). Like the Hiding Hand, it assumes that the risk context of decision-making differs from the uncertainty context of decision-making (Knight, 1921; Gigerenzer, 2020) where probability logic falls short as "we need to consider how we should make decisions when some of the alternatives, consequences, and probabilities are unknown (i.e., this requires heuristics and intuition)" (Love et al., 2024a, p. 205). The Fifth Hand principle is based on the theory of ecological rationality (Todd & Gigerenzer, 2012). This theory of decision-making under uncertainty, not risk, which puts forth an "adaptive toolbox" of heuristics – a set of evolved and learned rules that project actors deliberately and intuitively use to help deliver projects – stipulates that a heuristic is good when it matches the structure of the context where it is applied (Gigerenzer, 2020). The Fifth Hand and its underlying ecological rationality may thus help understand the circumstances under which projects successfully or unsuccessfully work (Ika et al., 2022; Love et al., 2024a, 2024b). Table I.3 compares the key theories of project behavior and their underlying assumptions.

## A Rough Typology of Theories of Project Behavior

The question of how to explain project behavior has preoccupied researchers and practitioners alike for decades. As we have mentioned, many project behavior theories have sought to explain, and even predict, project behavior. Following the work of the German psychologist, Gerd Gigerenzer, longtime director at the Max Planck Institute for Human Development, we may distinguish between "tools-to-theories," "as-if-theories," and "adaptive toolbox theories."

### *Tools-to-Theories of Project Behavior*

According to Gigerenzer (2020, p. 1367), tools-to-theories prevail in the case where "new theories can be inspired directly by new tools rather than by new data." In project management, these tools-to-theories correspond to optimization or computation tools such as cost-benefit analysis, CPM, and

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**Table I.3 A comparison of key theories of project behavior and their underlying assumptions**

| Project behavior theories (Underlying decision-making theories) | Expected utility theory (Expected utility theory) | Hiding Hand | Planning Fallacy (Prospect theory) | Theory of temporary organizations (Behavioral theory of the firm) | The Fifth Hand principle (Ecological rationality) |
|---|---|---|---|---|---|
| Level of analysis | Individual | Projects | Individual/projects | Projects as temporary organizations | Projects |
| Type of rationality | Logical rationality | Bounded rationality | Bounded rationality | Bounded rationality | Bounded rationality |
| Decision or action rationality? | Decision | Action | Decision | Action | Action |
| Decision-making context | Risk | Uncertainty | Risk | Risk | Uncertainty |
| Key authors | Piney (2003); Bernoulli (1738); von Neumann and Morgenstern (1944) | Hirschman (1967); Ika (2018) | Flyvbjerg (2006, 2016); Kahneman and Tversky (1979); Tversky and Kahneman (1992) | Lundin and Söderholm (1995); Cyert and March (1963); March and Simon (1958) | Ika et al. (2022); Todd and Gigerenzer (2012); Gigerenzer (2020) |

PERT where planned project schedules and costs determine project behavior and allow tight monitoring and control of the project to get the project back on track in case of deviations from the plan (Kreiner, 2014; Rolstadås et al., 2015). These tools preceded the so-called best-practice theories of project behavior, where project planning is the best practice par excellence, and they are concerned with what project behavior should be rather than what it really is. As Ika and Saint-Macary (2023, p. 180) write: "In short, the project defines the mandate, and the mandate defines the project. To succeed in one is to succeed in the other." As an example, a tool-to-theory such as critical chain project scheduling reminds us that the interest of the project does not coincide with the interests of all project actors; for example, project team members and managers may engage in self-preservation behavior and endeavor to protect themselves by padding project estimates (Goldratt, 1997). Nevertheless, critical chain still remains a statistical tool to optimize project duration and resources.

By and large, tools-to-theories project the formal structure of statistical tools inspired by Neyman and Pearson's statistical decision theory onto project behavior theories and thus cultivate the illusion that the real world of major projects is about risk rather than uncertainty and thus only optimization, not satisficing, can deliver success (Gigerenzer, 2020; Love et al., 2024a, 2024b). Notably, these tools-to-theories of project behavior focus on project management processes (Rolstadås et al., 2015) but they emphasize a sort of *in vitro* project behavior that can be controlled by the decision-maker; the project, which is "reified," is assumed to be "a well-oiled process designed to deliver a product or service that meets a specific need" (Ika & Saint-Macary, 2023, p. 177).

Tools-to-theories can also inspire new theories with other computational features: "new tools for data processing are introduced into a scientific community, from which new theories emerge that in turn require new kinds of data" (Gigerenzer, 2020, p. 1369). It might be argued that a most recent example of a tool-to-theory is the RCF technique, which, as we have noted previously, seeks to debias project cost estimates based on data on past similar projects, and thus has led to the development of what some might call "bias uplift theory" or "RCF theory" (Baerenfold, 2023) to apply *post hoc* corrections to cost estimates made by a project team (Flyvbjerg, 2006). This remains a case of tools-to-theories, considering the fact that

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RCF has been used in practice (Flyvbjerg & Cowi, 2004) before its underlying theory has been unraveled in project management (Flyvbjerg, 2006).

## As-If Theories of Project Behavior

The economist Milton Friedman (1953) in one of the memorable defenses of expected utility theory suggests that the realism of a theory does not count. What counts is only the accuracy of the theory in predicting behavior. As Gigerenzer (2020, p. 1370) recounts, "an explanation is only *as-if*. People behave *as if* they maximized expected utility… Friedman's as-if argument is still the standard interpretation of expected utility models in economics today."

In the area of project behavior, the classic example of an as-if theoretical principle is the Planning Fallacy. Project leaders behave *as if* they have perfect foresight of the future outcomes of their actions and updated probabilities consistent with Bayes' rule. Notably, Planning Fallacy proponents construe a project as "a consciously designed and planned *leap into a designed and desired future*" and, while the road to success may be bumpy, the destination appears to be known, as "it is given by human choice and purpose"; project management processes are by essence inconsequential for project success, as it was envisioned at the outset; and the project plan "allows us to see if subsequent events fit and, if not, to take corrective action." (Kreiner, 2020, p. 404). Further, the Planning Fallacy searches for correlations between project misbehavior and project underperformance, rather than underlying causes. The rationale is seductive but misleading: If there are cost overruns, then there is concomitantly (naïve or strategic) cost underestimation, which, in turn, without any empirical evidence, *should* explain cost overruns (Flyvbjerg et al., 2002; Flyvbjerg, 2016). Thus, we are left with the question: Where are the causal links between cost underestimation and cost overruns (Love et al., 2022; Pinto, 2023)?

To suggest project management processes are not critical according to the Planning Fallacy explanations of project behavior is, however, not surprising. It is a typical feature of as-if-theories of behavior. We note that prospect theory, the underlying explanation of Planning Fallacy, predicts behavior, yet it is "relatively silent on the cognitive processes underlying such behavior" (Holmes et al., 2011, p. 1078) After all, an as-if-theory tends to be "immune to critique of the reality of its assumptions" about project management processes "and can only be tested by predictions about behavior" (Gigerenzer, 2020, p. 1372) Thus, any practical application of the Planning Fallacy principle may represent a complex as-if normative benchmark to combat cost overruns and benefit shortfalls, which may, at best, work under risk (Ika et al., 2022). As Gigerenzer (2020, p. 1377) suggests, "As-if theories assuming expected utility maximization and Bayesian updating apply instead to situations of risk, where they can provide a normative benchmark but without insight into the cognitive processes."

## Adaptive Toolbox Theories of Project Behavior

As-if theories of project behavior such as the Planning Fallacy are unfit for decision-making under uncertainty, where the probability calculus *cannot* deliver the optimal solution (Ika et al., 2022). As Savage (1954, p. 16), who is the author of modern Bayesian decision theory, notes, it would be "utterly ridiculous" to apply it to non-"small world" situations such as "planning a picnic" where probability calculus falls short. Thus, the question, how does project decision-making occur under uncertainty remains to be addressed. Taking inspiration from the great American political scientist and organizational decision-making scholar Herbert Simon, a fierce critic of the universal use of as-if-theories of behavior (Simon, 1955, 1957), Gigerenzer sought to understand how experts make decisions under uncertainty, not risk, and devised formal models of heuristics to guide behavior "quickly and accurately" in true ecological rationality tradition, where these smart rules should match with the structure of their environment (Todd & Gigerenzer, 2012). He coined the term *adaptive toolbox* (Gigerenzer et al., 1999), which, again, he defines as the repertoire of heuristics an individual or an organization

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has learned over time, including the cognitive capacities that are needed to use these heuristics. Here, "behavior is a function of heuristics, which need to be adapted to the problem at hand" (Gigerenzer, 2020, p. 1373).

As we earlier discussed, the Fifth Hand conceptualization offers such an adaptive toolbox theory of project behavior, as it seeks to understand under what circumstances statistical tools – including probability calculus – work and in what circumstances heuristics and gut-feelings work (Ika et al., 2022). The Fifth Hand does not take project management processes for granted or construe them as inconsequential in the manner of as-if theories of project behavior such as the Planning Fallacy. But the key difference between the Fifth Hand, on the one hand, and tools-to-theories such as cost-benefit analysis and PERT, on the other hand, is that it operates under uncertainty, not risk. The ideas of the Fifth Hand have been applied to the determination of the cost contingency of major projects (Love et al., 2024a, 2024b). And although we are slowly but steadily peeling the layers back in our understanding of project behavior, additional work is necessary if we are to understand how project actors make decisions and take actions under uncertainty. This is even more crucial as their agency, creativity, learning, and innovation are crucial when it comes to delivering these major undertakings, and the stakes are high when we consider them in light of grand challenge projects (Ika & Munro, 2022).

The topic of project behavior, far from offering an esoteric or peripheral vision of projects in modern times, operates directly at the heart of our understanding of the organizational, social, political, human behavioral, computational/tool-based, and structural workings of projects aimed at addressing and alleviating a host of challenges quite literally worldwide. As our chapter has suggested, these challenges are at once definitional ("What do we mean?") and action-oriented ("What can we do?") imperatives that require modern scholars and practitioners alike to rethink the project puzzle, elevating and broadening their perspective, in order to face the "brave new world" of projects in a rapidly evolving, technology-driven, and "megathreats"-ridden era. It is with these goals in mind that we can turn our attention to the organization of this book and the contributions of our authors.

## The Structure of the Book

This handbook on project behavior (and misbehavior) is organized in three parts and contains chapters by a well-regarded and engaged set of international project management scholars to reflect on a broad spectrum of perspectives. Part I discusses the principles of project behavior and why they matter for project management theory and practice. Chapter 1, by Lavagnon Ika, entitled "The Rise and Fall of the Planning Fallacy: From the Impulsion to the Compulsion to Theorize," offers a historical and critical evaluation of the nature of Planning Fallacy explanations for project behavior, especially as they relate to project underperformance. His chapter presents a fuller picture of both the utility and shortcomings arising from this conceptualization. Graham Room (Chapter 2) follows with a chapter that lays out the key features of the Flyvbjerg/Hirschman controversy in the project literature, addressing the elements of both the Planning Fallacy and Hiding Hand while exploring some of the popular mythology and misunderstandings that continue to color our evaluation of these models. Along the way, he offers a defense of the Hiding Hand, suggesting that much of the resistance to Hirschman's views comes from a fundamental misunderstanding of his theory, his experimental setting, and the conclusions he drew. In this chapter, Room makes an important contribution to our recognition of project behavior as evidenced by two of its most well-known alternative theories.

Chapter 3 in Part I, on voyages of discovery, by Rebecca Vine, Dicle Kortantamer, and Andrew Davies, borrows its title from the well-known description of project behavior by Hirschman. In their chapter, these authors probe a critical theme in projects, recognizing that an open system characterized as one seeking discovery will fundamentally clash with closed-system imperatives, such as control or too-rigid governance. How a project can balance this critical junction of

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leadership, control, and capabilities is a resonant thesis that the authors address. In "Temporal Structuring and Project Behavior" (Chapter 4), Ann Langley and Gerry McGivern offer a fascinating appraisal of temporal structures and the lengths to which key project participants go to retain an open system, with frequent input from partners and the positive midcourse corrections to the plan that these interventions spawn. They demonstrate that time and temporality matter for project behavior, referring to the ways in which participants engage with projects and varying according to whether the project operates in a context where deadlines are immutable or not. Finally, Part I concludes with Fran Ackermann's contribution (Chapter 5) on the challenges of managing complexity and uncertainty in projects – two critical and interacting features that shape project behavior – through engaged stakeholder participation and continuous reappraisal. As stakeholder coalitions wax and wane through the project's life, it is necessary to frequently monitor and make midcourse adjustments based on their composition and evolving perceptions of project requirements. They conclude that attempts by project managers to respond to uncertainty may well result in added complexity that they need to confront in turn, making project behavior a dynamic and challenging phenomenon in practice.

Part II of the book is organized around the thorny problems found in project complexity and uncertainty. Van Oorschot, Dille, and Söderlund (Chapter 6) address the challenges of "averaging behavior," where complex projects composed of several sub-projects are susceptible to a form of balancing, in which divergent opinions of the status of the various sub-projects can lead to a desire to find a middle ground that actually results in overestimation of actual project performance. In presenting a longitudinal process study of an information systems project, they found that its hierarchy of sub-projects promoted unfavorable project behavior. Ralf Müller's (Chapter 7) exposure of the vagaries of intra- and inter-organizational project governance sheds important light on forms of subsequent project behavior. Notably, he takes the analogy of project personality to describe different types of project behavior, which may depend, for example, on whether projects take an inward or outward perspective, or they focus on the consequences of actions or instead their correctness. Miia Martinsuo and Siiri Tuominen (Chapter 8) elaborate on a critical feature of macro-project phenomena, discussing project portfolio management and behaviors that are sparked through strategic portfolio alignment, dealing with uncertainties, and pressures toward portfolio realignment. Using examples from five projects, they show that project behavior is both a source of uncertainty and a potential mechanism for activating and promoting strategic realignment.

Kate Davis, Liz Machtynger, and Francesco Di Maddaloni (Chapter 9) offer a deeper dive into the challenges and mechanisms by which project-based firms can identify and formulate strategies for stakeholder management. Further, they address project behavior challenges when including different stakeholder perceptions for project performance. Their chapter demonstrates that it is essential to control the project's outcome parameters through stakeholder expectations to minimize the chances of failure and maximize performance. Maude Brunet (Chapter 10) continues the focus on project governance with an intriguing chapter that identifies the dynamic nature of governance, as it can operate on three different models – hierarchical, heterarchical, and network – and to understand that shifts in project governance – proactive, reactive, radical, or evolutionary – provide turning points that shed light on project behavior, with far-reaching impacts on performance. Wolfgang Seibel and Katharina Eåmeyer (Chapter 11) provide a unique chapter that examines, through an extended case example, the issue of corruption in a project environment, specifically focusing on money laundering. They show how the tensions between the rationality of politicians and the rationality of administrative experts can challenge the delivery of the project and complicate its behavior over time. Continuing the theme of project behavior as pathology, the final chapter in Part II by Regis Signor and Peter Love (Chapter 12) focuses on the nature of mega-project corruption in the Brazil construction industry, reviewing a variety of causes and consequences of this ongoing challenge. Taking corruption as a

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willful, deceitful, and criminal project misbehavior enacted for monetary gain, they offer a chronological analysis of relevant facts and successive decisions taken by politicians and managers in specific mega-project cases and thus provide a context to understand how strategic misbehaviors occur in project settings.

Part III offers some chapters that address practical guidelines and applicable measures for dealing with project behavior, and more specifically, with varieties of misbehaviors. Ofer Zwikael, Alicia Gilchrist, and Jack Meredith (Chapter 13) kick off this part of the book with a discussion of the need for and methods to employ in setting realistic project goals, arguing that misbehaviors often occur in the margins; that is, where goals remain nebulous or open to multiple interpretations, there is a tendency for self-serving behaviors to exert themselves amongst the various stakeholders. Their contribution focuses on the analysis of seven major projects and offers ten practical recommendations to help managers set more realistic project goals. Their chapter is followed by Joana Geraldi, Verena Stingl, and Maximilian Schriewersmann's treatment (Chapter 14) of the use of decision heuristics to improve project screening, arguing that better initial selection through smart heuristics can militate against potentially ruinous investments that were undertaken for unclear reasons and help smooth front-end project behavior. Their chapter consists in an empirical study on heuristics used by senior managers to screen and select which of the tendering opportunities of major infrastructure projects to pursue. Joseph Harrisson, Jens Roehrich, and Mike Lewis (Chapter 15) continue the focus on project front-end in their chapter with clear suggestions on how to apply project governance methods – contractual and relational governance mechanisms – to manage and minimize misbehaviors – at the individual, team, and project levels – that can snowball once the project is fully under way. They show how the two functions of control and coordination of the contractual and governance mechanisms can help tackle project misbehaviors such as strategic misrepresentation at the project level, normalization of deviance at the team level, and narcissistic traits of leaders at the individual level.

Ashwin Mahalingam's contribution (Chapter 16) on twists and turns in project delivery provides a unique and highly readable account of his recent role in managing his own project – a residential construction – and discovering firsthand the manner in which misbehaviors and various out-turns occurred. Combining theory and real experience, his chapter is a refreshing look at the real way project vagaries assert themselves. Jeffrey Pinto and Greg Usher's chapter on project disruptions (Chapter 17) introduces the theme of calculated responses. It is common to talk of robustness, resilience, and antifragility as types of responses to project disruptions. This chapter examines each of these responses to disruption in turn, arguing that circumstances and proactive decision-making can result in disrupted projects that actually recover as stronger and more value-creating than originally envisioned. The final chapter in Part III, by Morten Welde and Gro Holst Volden (Chapter 18) presents some important guidance on addressing two of the thorniest behavior problems in new project delivery – exploring the means for minimizing benefit shortfalls while curbing cost increases. Their work with the Concept Research Program in Norway for many years has resulted in a chapter of practical and cutting-edge expertise.

The book concludes with an Afterword by Stewart Clegg. Modeled on a similar approach taken by the late Professor Peter Morris for *Making Projects Critical* by Hodgson and Cicmil (2006), we asked Professor Clegg to offer his unique perspective on the nature of project behavior, his critical assessment on the chapters herein contained, and thoughts on research and theory gaps that can form a roadmap for future studies. His chapter, looking at the contributions in this handbook, forms a wonderful concluding word on the subject and a call for future effort in continuing to examine the nature of project behavior.

This handbook has been the result of years of reflection and active scholarship on the nature of project behavior, the ways it can be understood to impact project development and delivery, and the pathologies so often found both causing and resulting from the myriad vagaries and out-turns that projects take. In noting that where projects are concerned, "there is many a slip 'twixt the cup and

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the lip," this handbook is the logical outworking of a stream of research that has been internationally recognized and ongoing for some years now. We would be remiss to not offer our greatest and most sincere thanks to Professor Peter Love, who has been a major source of inspiration, guidance, motivating light, and supportive colleague as we conclude this handbook. It is fair and appropriate to state that the book itself, as well as the theoretical understanding of project behavior, would not have seen the light of day were it not for his personal contributions and support. Likewise, we extend our many thanks to Valerie Appleby, Tobias Ginsberg, and Caroline Parkinson from Cambridge University Press who have helped us successfully navigate the complicated steps in this handbook project. Our gratitude also goes to the reviewers who have worked tirelessly to help authors improve their chapters.

To conclude, we noted at the outset that the current debate on large-scale projects overruns and overspends has been front and center in the project management literature for the past several years, with debates and positions being exchanged in the pages of a number of academic journals as well as the popular press. Given the likely unabating interest in the topic and the divergence of opinions being offered (particularly in this age of rapid development of mega-projects around the globe), we strongly believe that the time is ripe for a scholarly handbook on the current state of this challenge, perspectives on project behavior and misbehavior, and its implications for practitioners and project professionals responsible for delivering these high-profile and highly complex projects. Collecting the reasoned perspectives of a broad array of widely respected scholars has given us the opportunity to create a book that has both academic validity and practical power.

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