

Behavioral Economics In Construction: How Subcontractor Psychology Impacts Project Delivery

Explore how psychological factors like motivation, trust, and communication impact subcontractor performance and project timelines.

Aditya Pandit

Independent Researcher
Chesapeake, USA
aditya.pandit.003@gmail.com

Abstract:

Behavioral economics provides a crucial lens for understanding subcontractor decision-making and construction project performance. Traditional economic models assume rational actors optimizing cost and efficiency, but in reality, subcontractors' behavior is shaped by cognitive biases, risk perception, motivation, and trust dynamics with general contractors. This paper explores key behavioral economic principles—such as heuristics, present bias, and loss aversion—that influence subcontractor decision-making, impacting project delivery, scheduling, and cost efficiency. Psychological factors, including motivation theories like Maslow's hierarchy and Herzberg's two-factor model, explain how financial security, recognition, and autonomy drive subcontractor engagement. Communication strategies and trust-building measures are also examined to mitigate project risks associated with misaligned incentives and uncertainty. By integrating behavioral economic insights into construction management, project leaders can enhance subcontractor performance, reduce delays, and improve overall project efficiency. This study underscores the need for adaptive strategies considering subcontractor psychology in decision-making, scheduling, and contractual frameworks.

Keywords: Behavioral Economics, Subcontractor Decision-Making, Construction Project Management, Cognitive Biases, Risk Perception, Motivation Theories, Communication Strategies, Trust Dynamics, Loss Aversion, Heuristics, Present Bias, Project Scheduling.

1. INTRODUCTION

Behavioral economics studies how psychological, cognitive, and emotional factors influence economic decisions [1]. Unlike classical economic theory, which assumes that individuals act rationally to maximize their benefits, behavioral economics recognizes that decision-making is often irrational and influenced by biases, emotions, and social factors [2].

In the construction sector, especially among subcontractors, behavioral economics is particularly significant in dictating how activities are carried out, how timetables are followed, and how monetary rewards affect performance. Construction projects are dynamic, multifaceted settings where decisions are made in the face of uncertainty, time pressure, and cost pressure. Such pressures cause subcontractors to act in ways that do not always match old economic expectations. Some key aspects of behavioural economics relevant to construction management include:

a. Defaults Social and Emotional Factors

People stick with default options or the status quo [3]. Implementing "nudges" through appropriate default choices can help guide teams towards better outcomes. Humans are social animals influenced by emotions, relationships, and norms. Behavioral economics provides insights to leverage social and emotional factors to motivate teams and achieve organizational goals in construction [1]. By understanding how behavioral

tendencies can systematically influence judgment and decision-making in construction, managers can design processes, communications, and incentives to influence behavior and outcomes positively. This helps improve productivity, quality, safety, and project success.

Standard economic models presume that decision-makers in the construction industry are rational agents who methodically process all the given information, calculate costs and benefits, and optimize utility or profit [4]. In this framework, contractors, subcontractors, and clients should make optimal decisions based on complex calculations (i.e., hiring the lowest bidder, maximizing efficiency, or avoiding risks) [4]. Cost-benefit analysis (CBA) is the foundation of such a methodology, structuring choice as rational trade-offs between measurable inputs (e.g., time, materials, labor) and outputs (e.g., deadlines, quality, profit) [5].

However, the construction industry's dynamic, high-stakes, and complex nature frequently diverges from these idealized assumptions [6]. Behavioral economics challenges the concept of perfect rationality by introducing concepts such as:

b. Bounded rationality and Cognitive biases

The decision-maker suffers from cognitive limits, information shortage, and pressures of time and hence "satisfices" (good enough in contrast to perfect outcomes) [7]. For example, a project manager may approve a subcontractor's bid based on experience instead of conducting a thorough market survey. Rational systematic deviations, such as the planning fallacy (underestimation of time to complete a project), loss aversion (undue risk aversion in relation to gains), or anchoring (too great an overreliance on the first available information) further influence decision-making [8,9].

c. Heuristics

Heuristics are mental shortcuts used to simplify decisions, such as relying on industry norms ("this is how we have always done it") or prioritizing immediate rewards over long-term benefits (e.g., cutting corners to meet short-term deadlines) [10].

With construction, the behaviour determinants are aggravated further by uncertainty (weather delay, supply chain delivery failures), coordination challenges, and misaligned incentives among stakeholders. Behavioural economics, therefore, offers a means of explaining why decision-making differs from standard economic predictions in such conditions.

d. Why Subcontractor Behavior Matters

Subcontractors handle most of the physical labor on a building site [11]. Their psychological characteristics, such as risk perception, motivation, trust in GCs, and communication style, play important roles in project outcomes. A motivated subcontractor can insist on early completion, whereas a subcontractor with distrust for the GC because of delayed payments will hinder work as a defense mechanism.

Delays, cost overruns, and rework are often linked to subcontractor decision-making, which is heavily influenced by behavioral biases. By understanding the factors affecting subcontractors' motivation, construction managers can improve efficiency, reduce delays, and enhance project outcomes [12].

e. Objective of the Paper

This paper discusses the nexus between construction project management and behavioral economics regarding the psychological drivers that affect subcontractor behavior, such as motivation, trust, perception of risk, and communication. It also recommends methods to enhance subcontractor performance through behavioral economic techniques.

II. THE ROLE OF SUBCONTRACTORS IN PROJECT DELIVERY

a. Understanding the Construction Supply Chain

Subcontractors offer specialized services on a construction project. Unlike general contractors, subcontractors work on several projects at a time under tight margins and uncertain cash flows. Their performance is determined by their financial security, workload handling, and relationship with the general contractors [13]. The disintegrated structure of the construction industry requires subcontractors to deal with multiple contracts, ambiguous project schedules, and changing priorities. Such uncertainty impacts their decision-making and work prioritization.

b. Key Psychological and Economic Challenges

- Cash flow stress and late payments—Subcontractors usually face payment delays, which encourage risk-averse behavior [14]. If cash flow is in doubt, subcontractors tend to slow down work, direct resources elsewhere, or require more significant upfront payments to hedge risks.
- Unrealistic Scheduling & Project Uncertainty—Project managers' and contractors' optimism bias creates overly aggressive schedules [15]. Subcontractors overcommit while bidding but are unable to deliver on time, causing delays.
- Lack of Long-Term Contracts—Due to job insecurity, Subcontractors place more emphasis on short-term survival than long-term quality. Without the prospect of future employment, they could speed up work or make lowball bids to acquire contracts, putting them in the red and resulting in poor-quality work.

III. KEY BEHAVIORAL ECONOMIC FACTORS AFFECTING SUBCONTRACTORS**a. Motivation and Incentives in Construction Contracts**

Subcontractors are more sensitive to the threat of money loss than possible gain. Delays in payment or threats of penalty can induce defensiveness, and subcontractors may back off from reporting work progress. Excessive liquidated project damages can also drive subcontractors to pad bids to hedge against possible penalties.

Most subcontractors have an overconfidence bias, underestimating cost and time when submitting bids [16]. They end up underbidding and facing financial pressure while implementing. For instance, a subcontractor may lowball a bid for a drywall installation contract, hoping for labor availability, but face difficulties in acquiring skilled personnel to perform the job, causing delays.

Subcontractors determine if their work is equivalent to their remuneration. When unexpected project delays occur and they are still fined or not remunerated for overtime, morale drops. Such an imbalance lowers commitment and work standards.

b. Trust, Perceived Risk, and Decision-Making

Subcontractors tend to be subjected to delayed payments, contractual disputes, and scope creep [14]. This precedent of uncertain fiscal environments causes them to employ cautious practices, i.e., deferred mobilization against the receipt of payment or enhanced prices to neutralize perceived threats. Prospect Theory posits that individuals prefer certainty to possible gains [17]—subcontractors like smaller, certain payments instead of more significant, uncertain future payments. For instance, a painting subcontractor might negotiate weekly payments instead of a single payment at project completion to minimize financial uncertainty.

c. Communication and Psychological Biases in Project Execution

Cognitive biases affect how subcontractors interpret instructions. When project requirements are unclear, subcontractors will revert to known but wrong practices, make mistakes, and require rework. General contractors and engineers also presume that the level of technical knowledge is equal for subcontractors. This creates poor communication because the subcontractors might not want to ask questions for fear of seeming incompetent. Inefficient blueprints, unclear RFIs (Requests for Information), and a lack of standard terminology cause project inefficiency.

IV. SUBCONTRACTOR BEHAVIOUR PSYCHOLOGICAL DRIVERS

The psychological variables that motivate subcontractors to work on construction operations of various types go beyond money. Central motivation theories explain their performance.

a. Maslow's Hierarchy of Needs:

Maslow's hierarchy of needs, proposed by psychologist Abraham Maslow, is a motivational theory that explains human behavior based on fulfilling specific needs arranged in a hierarchical structure. Depicted visually as a pyramid, this model comprises five distinct levels, starting with fundamental physiological needs at the base and culminating in self-actualization at the top [18].

The first level addresses essential physiological needs such as food, water, shelter, and warmth—these must be satisfied before progressing to higher needs. Once physiological needs are met, individuals seek to fulfill safety needs, including security, stability, protection, and an organized society. The next level includes social needs, emphasizing interpersonal relationships like friendships, intimacy, and a sense of belonging. Esteem needs follow, highlighting the importance of self-esteem, confidence, respect, recognition, and personal achievement [18].

At the pyramid's apex is self-actualization, representing the desire to realize one's full potential, seek personal growth, self-fulfillment, and achieve peak life experiences. According to Maslow's theory, lower-level needs, such as physiological and safety requirements, must be adequately addressed before individuals can meaningfully pursue higher-level needs like esteem and self-actualization. Essentially, the fulfillment of each level acts as a prerequisite for moving upward within the hierarchy [18]. Subcontractors' priorities cease at the fulfillment of tertiary hierarchical needs [19].



b. Herzberg's Two-Factor Theory:

Psychologist Frederick Herzberg developed Herzberg's two-factor motivation-hygiene theory to explain workplace motivation and job satisfaction. The theory distinguishes between two primary job factors: motivators (intrinsic factors) and hygiene factors (extrinsic factors) [20]. Motivators are factors related to job satisfaction and personal growth, including achievement, recognition, responsibility, career advancement, and the nature of the work itself. These elements directly contribute to higher motivation levels by fulfilling an individual's psychological and professional development needs. On the other hand, hygiene factors consist of external conditions that, while necessary for maintaining stability in the workplace, do not actively drive motivation. These include company policies, supervision quality, working conditions, job security, and salary. Herzberg emphasized that hygiene factors prevent dissatisfaction but do not inherently lead to increased motivation or job satisfaction. Instead, true motivation arises when individuals experience intrinsic fulfillment through their work [20].

In the construction industry, Herzberg's principles help explain subcontractor behavior and performance. Hygiene factors such as fair payment terms, clear contractual agreements, and well-structured project conditions are essential for preventing dissatisfaction. For example, while timely payments ensure financial stability and reduce stress, they do not necessarily encourage subcontractors to exceed minimum project requirements. Conversely, intrinsic motivators such as autonomy, the opportunity to work on challenging

projects, and professional recognition are crucial in enhancing engagement and productivity. Subcontractors given decision-making flexibility and acknowledgment for quality work are likelier to exhibit proactive behavior, strive for higher standards, and contribute positively to overall project success [20].

Applying Herzberg's theory in construction management requires balancing hygiene factors with strong motivators. While ensuring fair treatment and stability through proper pay structures and working conditions is critical, construction managers must also implement motivation-enhancing strategies. Allowing subcontractors creative freedom in problem-solving, offering opportunities for skill development, and providing performance-based recognition can significantly improve project outcomes. By understanding and leveraging these behavioral factors, project managers can create an environment where subcontractors are satisfied and driven to perform at their best.

c. Self-Determination Theory (SDT):

Self-determination theory (SDT) is a macro theory of human motivation and personality that explores individuals' inherent growth tendencies and psychological needs. Developed by Deci and Ryan, SDT emphasizes the role of intrinsic motivation in shaping behavior and performance. Unlike extrinsic motivators such as financial incentives or external pressures, SDT posits that individuals are driven by three fundamental psychological needs: autonomy, competence, and relatedness. The fulfillment of these needs is essential for optimal well-being, mental health, and long-term motivation [21].

SDT distinguishes between two primary motivation types: autonomous and controlled. Autonomous motivation is behaviors performed out of personal interest, intrinsic satisfaction, or a sense of purpose. In contrast, controlled motivation arises from external pressures, such as deadlines, supervision, or financial incentives, which may lead to compliance but not engagement or commitment. Research suggests that autonomous motivation is strongly associated with higher job satisfaction, creativity, and productivity, while controlled motivation can result in short-term compliance but often leads to disengagement over time [21].

In the construction industry, particularly among subcontractors, SDT is critical in influencing work performance, retention, and overall job satisfaction. Autonomy allows subcontractors to control their work methods, such as flexibility in scheduling tasks and decision-making authority on-site. This fosters a sense of ownership and responsibility, leading to greater engagement. Competence refers to subcontractors' ability to develop and master skills through training and experience, which enhances confidence and work efficiency. Subcontractors are likelier to perform at higher standards when provided with learning opportunities and skill development programs. Relatedness involves establishing positive relationships with general contractors, project managers, and peers, which fosters collaboration and trust in construction projects. A work environment that encourages communication and teamwork significantly improves morale and reduces turnover rates [21].

Construction managers can leverage SDT principles by designing work environments that nurture these psychological needs. Providing subcontractors with greater autonomy in task execution, access to professional training, and opportunities for relationship-building through collaborative project management can enhance motivation and long-term commitment. Projects integrating these elements will likely experience improved subcontractor engagement, lower attrition rates, and higher-quality work outcomes. Project managers can create a more sustainable and productive construction workforce by recognizing the intrinsic motivators that drive subcontractors.

d. Social Pressures, Procrastination, and Time Management

Various psychological and behavioral economic factors influence subcontractor performance in construction projects, including social pressures, procrastination, and industry norms. These factors can significantly impact project timelines, efficiency, and overall quality. Understanding how behavioral tendencies shape subcontractor decision-making can help construction managers implement strategies to mitigate delays and enhance productivity.

e. Present Bias and Task Delays

Like all individuals, subcontractors are susceptible to present bias, a cognitive tendency to prioritize immediate rewards over long-term benefits. This bias often leads to procrastination, particularly when tasks seem overwhelming or subcontractors face immediate financial pressures. For instance, if a subcontractor is juggling multiple projects, they may prioritize tasks that offer quicker financial returns rather than adhering to a long-term project schedule. This behavior can result in delays, last-minute rushes to meet deadlines, and compromised work quality. Additionally, uncertainty regarding future payments or project funding may push subcontractors to allocate resources elsewhere, further contributing to inefficiencies. Construction managers can address present bias by breaking large tasks into smaller, manageable milestones with incremental financial incentives. This strategy encourages subcontractors to maintain steady progress rather than deferring work until the last minute [22].

f. Herd Mentality and Industry Norms

In construction environments, subcontractors often exhibit a herd mentality, meaning they are influenced by the behaviors and pace of others within the project. If a project experiences frequent delays, individual subcontractors will likely slow their pace to match the prevailing work rhythm rather than strive for early completion. This behavior stems from a psychological inclination to conform to group norms and avoid deviating from collective expectations. Herd mentality can be particularly detrimental in large-scale construction projects where delays become normalized, reducing overall efficiency. Moreover, subcontractors may hesitate to complete their work ahead of schedule if they perceive their efforts will not be reciprocated by other trades or rewarded by the general contractor.

To counteract the effects of herd behavior, construction managers can implement structured scheduling techniques that emphasize accountability and individual performance tracking. Providing visible progress reports, setting firm deadlines, and creating competitive incentives can encourage subcontractors to remain on schedule despite industry norms. Additionally, fostering a culture of early completion by recognizing high-performing subcontractors can gradually shift industry behaviors toward increased efficiency [23].

By addressing present bias through milestone-based incentives and combating the herd mentality with transparent scheduling and performance recognition, construction managers can reduce procrastination and delays, leading to more efficient project delivery and improved subcontractor engagement.

V. MEASURES TO ENHANCE SUBCONTRACTOR PERFORMANCE

Financial security and cash flow stability heavily influence subcontractor performance in construction projects. General contractors are pivotal in improving subcontractor motivation and efficiency by implementing fair and timely payment practices. Ensuring subcontractors receive predictable and structured payments can reduce financial stress, enhance commitment, and improve project outcomes.

One of the most effective strategies for supporting subcontractor performance is establishing clear payment milestones rather than relying on a single lump-sum payment upon project completion. For example, a drywall subcontractor may receive 20% upon mobilization, 30% upon installation completion, 30% after inspection, and 20% upon punch list closure. Such an approach provides subcontractors with incremental financial security, ensuring they have adequate resources to complete their work efficiently. Research indicates that milestone payments can reduce project delays by up to 30% by fostering a stronger sense of progress and commitment [14].

General contractors should implement automated payment issuance upon third-party verification of milestone completion to further streamline the payment process. This eliminates payment bottlenecks, enhances transparency, and reassures subcontractors of financial reliability. Additionally, standard industry practices often involve withholding a portion of payments (retainage) until project completion to ensure quality control. However, excessive retainage periods can erode trust and create financial strain for subcontractors. To mitigate these concerns, general contractors should limit retainage to no more than 5% and release 50% upon substantial project completion, particularly for subcontractors with a strong track record of performance [12].

Furthermore, the timely release of retainage—within 30 days of project completion—can be a powerful incentive for subcontractors to maintain high-quality work standards and adhere to project timelines. By demonstrating good faith through equitable financial practices, construction managers can minimize subcontractor hesitancy, reduce risk-averse behaviors, and ensure sustained motivation throughout project execution and closeout. Implementing fairer financial policies enhances subcontractor trust and improves workforce stability, increasing efficiency and project success.

VI. PSYCHOLOGICAL ASPECTS OF COMMUNICATION

a. Framing Effect:

The framing effect is a cognitive bias that occurs when people react to situations differently depending on how information is presented to them, even if the objective facts are the same. How information is framed or presented about the project considerably influences how subcontractors interpret issues and risks [24]. Focusing on potential cost reductions from value engineering may lead to less strict interpretations of specifications than highlighting budgetary limitations, which triggers compliance issues. The same factual premises are assessed differently depending on whether the project frame is gain— or non-loss-oriented. Project managers should know that framing influences mindsets and impacts subcontractor cooperation, change-order reactions, and quality/schedule trade-off decisions. Strategic communication framing is an insidious yet effective behavioral device for achieving alignment on construction projects.

b. Confirmation Bias:

Confirmation bias is the tendency to search for, interpret, favor, and recall information that confirms or strengthens one's prior personal beliefs or hypotheses. It is a type of cognitive bias. Some key aspects of confirmation bias include:

- Actively seeking out information that supports preconceptions while ignoring or rejecting information that contradicts them. This can involve emphasizing facts that agree with prior beliefs and downplaying ones that disagree.
- Interpreting ambiguous evidence as supporting existing attitudes. Data that might reasonably have different interpretations are selectively perceived as validations of one's beliefs.
- Recall information selectively, remember facts or interpretations that fit preconceptions and forget those that do not.

Subcontractors are vulnerable to confirmation bias in project communications by selectively perceiving and processing information that confirms their beliefs and rejecting disconfirming information [25]. For example, a subcontractor with a negative attitude toward a specific project manager will interpret ambiguous communications as critical. In contrast, a trusting subcontractor will always give the benefit of the doubt. This type of bias would be particularly damaging to group problem-solving if subcontractors read information in a biased manner to verify preconceptions instead of updating beliefs based on all the information at hand. The project manager will be responsible for predicting how confirmation bias colors information processing and accessing a level of neutrality that permits bilateral decision-making.

VII.COMMUNICATION AND DECISION-MAKING: ENHANCING SUBCONTRACTOR COORDINATION

a. Why Project Communication Matters

Effective communication is the foundation of successful construction projects, yet traditional communication methods often fail to account for the psychological and behavioral dynamics between stakeholders. Miscommunication can lead to delays, cost overruns, and inefficiencies, particularly in complex, multi-stakeholder environments such as construction [22]. To enhance coordination and alignment, project managers must proactively address communication barriers, ensure clarity in information exchange, and foster collaboration. Research suggests that integrating principles from behavioral economics, such as framing effects and cognitive biases, can improve how project information is conveyed and interpreted, leading to

better decision-making and engagement [24]. Additionally, leveraging **technological innovations**, such as real-time project management software and digital collaboration tools, can enhance transparency, streamline workflows, and minimize misunderstandings [8]. A structured and psychologically informed approach to communication mitigates risks and strengthens teamwork, ultimately improving project efficiency and success.

b. Leveraging Visual Cues and Digital Tools for Enhanced Project Communication

Traditional project schedules and documentation in construction rely heavily on written text, which can often be challenging for subcontractors to interpret and translate into actionable tasks. Integrating visual elements into project planning significantly improves communication, clarity, and schedule adherence. Research suggests that visual-based communication strategies enhance comprehension, reduce errors, and improve task execution efficiency compared to text-heavy documents [22].

General contractors should implement color-coded work breakdown structures and graphical scheduling diagrams using project management software such as Microsoft Project or Primavera P6 to facilitate better coordination. These visual tools represent task dependencies, enabling subcontractors to understand their roles within the broader project timeline. Additionally, real-time scheduling applications allow for continuous updates from the job site, providing automatic notifications and reminders for upcoming tasks. By utilizing these digital solutions, subcontractors can stay informed and aligned with project objectives, minimizing miscommunication and delays [8].

Using graphical representations aligns with cognitive psychology principles, leveraging the human brain's natural preference for visual processing. "At-a-glance" visual summaries enhance project transparency, making it easier for subcontractors to track progress and maintain accountability. Furthermore, digital tools that integrate with mobile applications enable subcontractors to access schedules, updates, and instructions directly from their smartphones, fostering greater engagement and adherence. Studies indicate that incorporating visual aids into construction project management reduces ambiguity and enhances compliance, ultimately improving efficiency and project success [14].

c. Framing Instructions Positively

How information is framed significantly influences how individuals interpret and respond to instructions. In construction project management, wording can motivate subcontractors to achieve quality outcomes or induce defensive and risk-averse behaviors. Research in behavioral psychology suggests that negatively framed instructions—such as "Do not make mistakes"—tend to trigger aversion and self-doubt, resulting in cautious, unproductive decision-making and a reluctance to take initiative.

Conversely, positively framed instructions emphasize desired outcomes rather than focusing on avoiding mistakes, fostering an aspirational mindset. For instance, instead of saying, "Avoid errors in wiring installation," a project manager might phrase the instruction as, "Ensure this method produces an optimal wiring configuration." This subtle shift in language highlights compliance with quality standards constructively, alleviating anxiety and promoting proactive engagement [25].

Studies show that positively worded instructions greatly enhance receptiveness, cooperation, and overall project performance. When subcontractors receive feedback and directives framed regarding opportunity and achievement, they are more likely to internalize expectations, take ownership of their tasks, and strive for excellence. By purposefully structuring communication in affirmative and solution-focused terms, construction managers can boost subcontractor motivation, increase compliance rates, and encourage a more collaborative work environment [23].

d. Avoiding Time Management Traps

Construction projects involve multiple interdependent tasks that must be executed in a coordinated fashion to meet deadlines. However, due to various behavioral tendencies, subcontractors often face time management challenges that can result in inefficiencies and delays. Factors such as present bias, optimism bias, and cognitive overload can impact subcontractor performance, making it crucial for project managers to implement strategies that mitigate these risks. Construction managers can improve efficiency and ensure

subcontractors stay focused and productive by breaking down large tasks into manageable segments and streamlining decision-making processes.

e. Breaking Large Tasks into Smaller, Short-Term Targets

Complex and large-scale construction projects can lead to procrastination among subcontractors, primarily due to present bias—the tendency to prioritize immediate concerns over long-term benefits—and optimism bias, which causes individuals to underestimate the effort needed for task completion. When subcontractors view a task as overwhelming, they may delay its initiation, increasing the likelihood of project delays [16].

To address this issue, general contractors should break down work packages into smaller, clearly defined tasks for daily or weekly completion, ensuring no deadline exceeds one month. This strategy promotes a sense of near-term accountability, enhancing the perception of consistent progress and achievement. Weekly planning meetings can create detailed task lists with subcontractor input, ensuring alignment with project goals. Regular check-ins also help maintain focus, tackle unexpected challenges, and facilitate necessary adjustments [17]. Project managers can lessen the psychological barriers associated with large-scale assignments by breaking tasks into incremental, short-term milestones. This approach boosts motivation and decreases the chances of task postponement, ensuring a steady workflow and enhancing project efficiency.

f. Reducing Cognitive Load in Decision-Making

Construction projects often involve complex information processing, requiring subcontractors to interpret technical documentation, navigate design modifications, and respond to unforeseen challenges. However, in high-pressure environments, the cognitive load of evaluating intricate details can lead to decision fatigue, increasing the likelihood of delays, misinterpretations, and errors [18]. Project managers should implement simplified decision-making frameworks to mitigate cognitive overload that facilitate quick and effective problem-solving. One effective method is using pre-filled Request for Information (RFI) forms and standardized templates, reducing subcontractors' effort to respond. By incorporating pre-populated fields and drop-down menus, project teams can minimize unnecessary manual input while ensuring clarity and consistency in documentation. Furthermore, providing clear examples and predefined expectations for reporting requirements allows subcontractors to focus on relevant project details without excessive drafting or research. This approach not only prevents analysis paralysis—a situation where excessive information leads to indecision—but also enhances the speed and accuracy of decision-making processes [26]. By streamlining information processing and lessening the cognitive strain associated with complex project decisions, construction managers can boost subcontractor efficiency, improve compliance with project timelines, and minimize errors that could otherwise contribute to costly delays.

VIII.CONCLUSION

The findings of this study highlight that subcontractor behavior in construction projects is heavily influenced by psychological and economic factors that extend beyond conventional rational choice models [5]. Cognitive biases, risk aversion, financial uncertainty, and trust in project stakeholders significantly impact subcontractor decision-making, ultimately affecting project timelines and outcomes [4], [5]. Integrating behavioral economic principles into construction management practices can enhance subcontractor motivation, mitigate delays, and improve efficiency [8]. Key strategies, such as structured milestone payments, transparent communication, positive reinforcement, and trust-building measures, can reduce risk-averse behaviors and encourage proactive engagement [7], [8].

Understanding the motivational drivers of subcontractors—whether through Herzberg's theory, Maslow's hierarchy, or self-determination principles—enables project managers to tailor incentive structures that align with subcontractors' psychological needs [19]. Additionally, addressing cognitive biases, such as the planning fallacy, anchoring bias, and present bias, can lead to more realistic project scheduling and better financial decision-making [20], [21]. By recognizing these factors and implementing behavioral economic strategies, construction managers can optimize subcontractor performance and contribute to the overall success of construction projects.

IX. FUTURE RECOMMENDATIONS

While this study provides insights into the behavioral economic factors affecting subcontractors in construction, further research is necessary to develop comprehensive frameworks for practical implementation. The following areas are recommended for future study:

1. Behavioral Contracting Models – Future research should explore contractual models that integrate behavioral economic insights, ensuring fair risk-sharing mechanisms and motivation-driven incentives [23].
2. Technology and Digital Solutions – Investigating how digital platforms, real-time payment tracking, and AI-driven scheduling tools can mitigate cognitive biases and enhance subcontractor efficiency [24].
3. Comparative Studies Across Regions – Analyzing subcontractor behavior across different economic and cultural contexts to determine the universality of behavioral economic principles in construction management [25].
4. Longitudinal Case Studies – Conducting long-term studies on projects implementing behavioral economic strategies to assess their impact on efficiency, cost reduction, and project success [27].
5. Trust Dynamics in Subcontractor-GC Relationships – Examining the role of trust-building strategies, such as transparency in contract terms and collaborative problem-solving, in reducing subcontractor defensiveness and enhancing engagement [2].

By incorporating behavioral economic principles into construction project management, the industry can develop more resilient, efficient, and psychologically informed approaches to subcontractor engagement, ultimately driving better project outcomes.

REFERENCES:

1. A. Beatty, R. Moffitt, and A. Buttenheim, "Development of Behavioral Economics," www.ncbi.nlm.nih.gov, Apr. 20, 2023. Available: <https://www.ncbi.nlm.nih.gov/books/NBK593518/>
2. M. I. Ogu, "Rational Choice Theory: Assumptions, Strengths, and Greatest Weaknesses in Application outside the Western Milieu Context," *Nigerian Chapter of Arabian Journal of Business and Management Review*, vol. 1, no. 3, pp. 90–99, Feb. 2013, <https://doi.org/10.12816/0003628>. Available: <https://pdfs.semanticscholar.org/88f8/5e51aad54ef5a564e270bf54cc5ba8fdf3da.pdf>
3. Y. Xiong, "Status Quo Bias in Behavioral Economics and Its Applications," *BCP Business & Management*, vol. 25, pp. 352–356, Aug. 2022, doi: <https://doi.org/10.54691/bcpbm.v25i.1842>
4. G. Hochman and D. Ariely, *Emerging Trends in the Social and Behavioral S.* 2015, pp. 1–14. doi: <https://doi.org/10.1002/9781118900772.etrds0022>
5. A. M. Belay, O. Torp, C. Thodesen, and J. Odeck, "A Framework for Organizing a Resilient Cost Benefit Analysis for Construction Projects," *Procedia Engineering*, vol. 145, pp. 1169–1176, 2016, doi: <https://doi.org/10.1016/j.proeng.2016.04.151>
6. J. Tariq and S. S. S. Gardezi, "Study the Delays and Conflicts for Construction Projects and Their Mutual relationship: a Review," *Ain Shams Engineering Journal*, vol. 14, no. 1, p. 101815, 2022, doi: <https://doi.org/10.1016/j.asej.2022.101815>
7. N. Raj, "Effects of Behavioural Economics on Decision-Making," *ResearchGate*, Apr. 11, 2024. Available: https://www.researchgate.net/publication/379752221_Effects_of_Behavioural_Economics_on_Decision-Making
8. L. A. Ika, P. E. D. Love, and J. K. Pinto, "Moving beyond the Planning Fallacy: the Emergence of a New Principle of Project Behavior," *IEEE Transactions on Engineering Management*, vol. 69, no. 6, pp. 1–16, 2020, doi: <https://doi.org/10.1109/tem.2020.3040526>
9. F. Lieder, T. L. Griffiths, Q. J. M. Huys, and N. D. Goodman, "The Anchoring Bias Reflects Rational Use of Cognitive Resources," *Psychonomic Bulletin & Review*, vol. 25, no. 1, pp. 322–

- 349, May 2017, doi: <https://doi.org/10.3758/s13423-017-1286-8>. Available: <https://link.springer.com/article/10.3758/s13423-017-1286-8>
10. S. Dale, "Heuristics and biases: the Science of decision-making," *Business Information Review*, vol. 32, no. 2, pp. 93–99, Jun. 2015, doi: <https://doi.org/10.1177/0266382115592536>. Available: https://www.researchgate.net/publication/281232107_Heuristics_and_biases_The_science_of_decision-making
 11. S. T. Ng and Z. Tang, "Labour-intensive Construction sub-contractors: Their Critical Success Factors," *International Journal of Project Management*, vol. 28, no. 7, pp. 732–740, Oct. 2010, doi: <https://doi.org/10.1016/j.ijproman.2009.11.005>
 12. X.-H. Jin, Y. Feng, M. Hardie, and S. Saha, "Improving Subcontractor's Motivation by Construction Managers," 2012. Available: https://www.irbnet.de/daten/iconda/CIB_DC27128.pdf
 13. S. T. Ng and M. Skitmore, "Developing a Framework for Subcontractor Appraisal Using a Balanced Scorecard," *Journal of Civil Engineering and Management*, vol. 20, no. 2, pp. 149–158, Mar. 2014, doi: <https://doi.org/10.3846/13923730.2013.802705>
 14. S. Bolton, G. Wedawatta, N. Wanigarathna, and C. Malalgoda, "Late Payment to Subcontractors in the Construction Industry," *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, vol. 14, no. 4, Nov. 2022, doi: [https://doi.org/10.1061/\(asce\)la.1943-4170.0000552](https://doi.org/10.1061/(asce)la.1943-4170.0000552)
 15. A. Chadee, S. R. Hernandez, and H. Martin, "The Influence of Optimism Bias on Time and Cost on Construction Projects," *Emerging Science Journal*, vol. 5, no. 4, pp. 429–442, Aug. 2021, doi: <https://doi.org/10.28991/esj-2021-01287>
 16. B. Flyvbjerg, "Top Ten Behavioral Biases in Project Management: An Overview," *Project Management Journal*, vol. 52, no. 6, pp. 531–546, Dec. 2021.
 17. A. Chiu and G. Wu, "Prospect Theory," *Wiley Encyclopedia of Operations Research and Management Science*, Jan. 2011, doi: <https://doi.org/10.1002/9780470400531.eorms0687>
 18. D. T. Kenrick, V. Griskevicius, S. L. Neuberg, and M. Schaller, "Renovating the Pyramid of Needs: Contemporary Extensions Built Upon Ancient Foundations," *Perspectives on Psychological Science*, vol. 5, no. 3, pp. 292–314, 2010. Available: <https://doi.org/10.1177/1745691610369469>
 19. S. A. Dar, "Maslow's Hierarchy of Needs Is Still Relevant in the 21st Century," *ResearchGate*, Aug. 08, 2022. Available: https://www.researchgate.net/profile/Showkat-Dar-13/publication/368327434_Maslow
 20. S. K. Tan, "Herzberg's Two-Factor Theory on Work Motivation: Does It Work for Today's Environment?" *Global Journal of Commerce and Management Perspective*, vol. 2, pp. 18–22, 2013
 21. L. Legault, "Self-Determination Theory," *Encyclopedia of Personality and Individual Differences*, vol. 1, no. 1, pp. 1–9, 2017, doi: https://doi.org/10.1007/978-3-319-28099-8_1162-1
 22. P. E. D. Love, L. A. Ika, and J. K. Pinto, "Fast-and-frugal Heuristics for decision-making in Uncertain and Complex Settings in Construction," *Developments in the Built Environment*, vol. 14, p. 100129, Apr. 2023, doi: <https://doi.org/10.1016/j.dibe.2023.100129>
 23. T. Yasserli and J. Reher, "Fooled by facts: Quantifying Anchoring Bias through a large-scale Experiment," *Journal of Computational Social Science*, vol. 5, no. 1, pp. 1001–1021, Jan. 2022, doi: <https://doi.org/10.1007/s42001-021-00158-0>
 24. S. M. Carpenter, "Framing Effects," *Encyclopedia of Animal Cognition and Behavior*, pp. 1–7, 2018, doi: https://doi.org/10.1007/978-3-319-47829-6_1571-1. Available: https://link.springer.com/referenceworkentry/10.1007%2F978-3-319-47829-6_1571-1
 25. U. Peters, "What Is the Function of Confirmation bias?," *Erkenntnis*, vol. 87, no. 3, pp. 1351–1376, Apr. 2022, doi: <https://doi.org/10.1007/s10670-020-00252-1>. Available: <https://link.springer.com/article/10.1007/s10670-020-00252-1>



26. M. Galanakis and G. Peramatzis, “Herzberg’s Motivation Theory in Workplace,” Journal of Psychology Research, vol. 12, no. 12, pp. 971–978, Dec. 2022.
27. M. Bugdol and D. Puciato, “Punishment of employees: Its causes, types, and consequences, as Well as Factors Determining Punishment for Poor Quality,” Chicago, 2023.