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Review Article

Reconceptualizing International Climate Governance from the Perspective of Cognitive Biases: A Normative–Analytical Framework

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Abstract

This study aims to reconceptualize the chronic performance gaps in international climate governance from the perspective of cognitive biases. Despite more than three decades of international negotiations and numerous multilateral agreements, global emission trajectories continue to fall short of scientific requirements, necessitating an analytical framework that transcends conventional explanations. Drawing on bounded rationality theory, the study systematically examines how status quo bias, loss aversion, and temporal biases shape climate governance processes. Employing a conceptual and interpretive methodology based on interdisciplinary literature review, the research integrates cognitive psychology, international relations, and normative climate ethics literatures within a unified framework. Findings reveal that a significant portion of structural inaction in climate governance is directly related to systematic cognitive biases. Status quo bias facilitates the unquestioned perpetuation of fossil fuel-based development models, while loss aversion causes short-term economic costs to overshadow long-term climate benefits. Temporal biases lead to the systematic neglect of future generations' interests, thereby undermining intergenerational justice principles. The study demonstrates that cognitive biases are not confined to the individual level but become embedded in institutional structures and reproduced over time. In this context, the persistence of voluntary commitment-based governance models is interpreted as an institutional manifestation of status quo bias. The normative-analytical framework offers an original contribution to climate ethics by linking cognitive findings with justice and legitimacy debates. The study argues that the effects of cognitive biases can be mitigated through transparency mechanisms, feedback loops, and framing strategies, emphasizing that cognitively informed governance designs must be developed in alignment with democratic values and ethical principles. Ultimately, the research proposes a more realistic decision-making model for climate governance studies by moving beyond the rational actor assumption.

Introduction

International climate governance constitutes one of the most intricate global problematics of the twenty-first century. This complexity derives not merely from technical or environmental dimensions, but equally from the interpenetration of political, economic, and ethical dimensions. The transboundary, intergenerational, and multidimensional character of climate change confronts states and international organizations with an unprecedented requirement for collective action. Nevertheless, despite more than three decades of international negotiation processes and innumerable multilateral agreements, global emission trajectories continue to fall substantially short of scientific imperatives [1]. This circumstance unequivocally reveals the structural limitations of the institutional evolution extending from the United Nations Framework Convention on Climate Change to the Paris Agreement. This striking disparity cannot be adequately explained solely by the absence of political will or conflicts of interest. Although conventional explanations have foregrounded the relative gains of states, asymmetric power relations, and institutional capacity deficiencies, they have largely overshadowed the cognitive dimension of decision-making processes. Yet climate policy consists of nothing more than the aggregate of decisions shaped under conditions of high uncertainty, temporal remoteness, and probabilistic complexity. These distinctive conditions render it inevitable that decision-makers resort to systematic cognitive heuristics and biases [2]. Cognitive heuristics function as mental shortcuts directed toward resolving the tension between limited information-processing capacity and complex decisions. Consequently, to comprehend the structural impasses of international climate governance, it becomes imperative to acknowledge the analytical centrality of cognitive processes. This study aims to reconceptualize international climate governance from the perspective of cognitive biases in order to address the aforementioned imperative.

The rich body of knowledge accumulated over the past half-century in the fields of cognitive psychology and behavioral economics has profoundly revealed the systematic limitations of human decision-making. This body of knowledge has fundamentally undermined the assumption of full rationality in classical economic theory and initiated a paradigmatic transformation in decision-making research. The intellectual trajectory extending from Herbert Simon's concept of bounded rationality [3] to Daniel Kahneman and Amos Tversky's prospect theory [4,5] demonstrates that the rational actor assumption possesses no descriptive validity beyond being a normative ideal. The information-processing operations of individuals and collective actors are susceptible to systematic deviations due to environmental complexity and cognitive capacity constraints. These deviations manifest not as random errors, but as predictable, recurrent patterns that intensify under particular conditions. Kahneman's dual-process theory explains these patterns through the interaction between the fast and intuitive System 1 and the slow and analytical System 2 [2]. Status quo bias, loss aversion, temporal discounting, excessive optimism, and framing effects rank among the most thoroughly documented forms of these patterns. The discipline of international relations has begun to internalize these insights, particularly in the contexts of foreign policy analysis, crisis management, and war decisions [6,7]. Nevertheless, the systematic adaptation of these findings to a problematic domain such as climate governance—one that progresses slowly, is abstract, and temporally deferred—remains in its nascent stages. This study aims to establish a durable and generative bridge between the behavioral international relations literature and climate governance scholarship.

The existing architecture of international climate governance has evolved, particularly in the post-Paris Agreement period, into a flexible structure predicated upon voluntary nationally determined contributions. This evolution represents a distinct departure from the top-down structure of the Kyoto Protocol with its binding targets. This architecture has, on the one hand, enabled broad participation by alleviating sovereignty concerns; on the other hand, it has deepened the obstacles to establishing ambitious and binding targets [8]. From a cognitive perspective, this institutional choice can be interpreted not merely as the outcome of rational optimization, but simultaneously as a reflection of the reproduction of status quo bias and loss aversion at the collective level. Status quo bias engenders a psychological preference for the current state of affairs, while loss aversion causes potential losses to be perceived as approximately twice as weighty as potential gains [5]. States systematically prioritize the short-term economic costs arising from fossil fuel-based development models over long-term climate gains. This tendency is not confined to the psychological vulnerabilities of individual decision-makers; it is reproduced in international negotiation settings through groupthink, mutual confirmation mechanisms, and institutional inertia [9]. Consequently, the performance gaps in climate governance cannot be fully comprehended without the assumption that cognitive biases have become institutionalized and acquired a systemic character. This study aims to offer an original contribution to the climate governance literature by supporting this assumption with analytical grounding.

The fundamental purpose of this article is to reconceptualize international climate governance from the perspective of cognitive biases and to elucidate both the analytical and normative implications of this reconceptualization. This reconceptualization positions itself as a perspective that complements and deepens existing theoretical frameworks rather than rejecting them. The study critically interrogates the extent to which the rational actor assumption remains problematic in the decision-making processes of states, international organizations, and negotiating coalitions. In this direction, the concepts of bounded rationality, heuristic decision-making, and cognitive shortcuts are employed as fundamental analytical building blocks [2,3]. The concept of bounded rationality assumes that decision-makers seek satisficing rather than optimal solutions and that their information-processing capacities fall short of environmental complexity. The methodology of the research is a conceptual and interpretive examination predicated upon an interdisciplinary literature review; the cognitive psychology literature is systematically integrated with the international relations and climate governance literatures. This methodological choice aims to offer an explanatory and interpretive framework rather than to conduct an empirical causality test. Accordingly, the study aspires to produce a theory-developing and concept-deepening contribution. This approach enables the strengthening of the analytical foundations of normative debates and provides a bidirectional analysis that jointly evaluates both how climate governance operates and how it ought to operate.

In terms of the conceptual framework, the study is organized around three fundamental building blocks: international climate governance, cognitive biases, and normative-analytical assessment. International climate governance is defined as the totality of institutional and normative structures that regulate the struggle against climate change through intergovernmental negotiations, multilateral agreements, and multi-level actor networks [10]. This definition distinguishes governance from the concept of government and offers a broad framework that encompasses the role of non-state actors, the private sector, and civil society. This definition provides a broad framework that does not confine governance solely to formal institutions but also encompasses norms, practices, and discourses. Cognitive biases are conceptualized as mental tendencies that engender systematic deviations in the information-processing operations of individuals and collective actors [4]. These biases should not be conflated with irrationality; rather, they are the evolutionary and functional products of cognitive limitations. From an evolutionary perspective, these biases can be evaluated as mental mechanisms adapted for our ancestors' survival; however, they may lead to systematic errors in modern complex decision environments. The normative-analytical framework denotes an integrative perspective that both describes how current governance practices operate and evaluates how they ought to operate. These three conceptual building blocks constitute the analytical backbone of the study and render the cognitive dimension of climate governance systematically visible.

In light of these conceptual foundations, the principal research question of the article is formulated as follows: How do cognitive biases shape the functioning and effectiveness of international climate governance? This question aims to illuminate causal mechanisms and processual dynamics beyond offering a descriptive explanation. Three auxiliary questions accompanying this principal question concretize the analytical scope of the research. First, which cognitive biases emerge more prominently and effectively in international climate negotiations and commitment processes? Second, in which institutional and political contexts do these cognitive biases intensify or attenuate? Third, through which governance designs can the normatively problematic consequences of cognitive biases be mitigated? This series of questions constitutes a comprehensive research agenda extending from descriptive analysis to normative evaluation and policy recommendations. These questions enable not merely describing the cognitive dimension of climate governance, but also generating normative and institutional implications. The research questions are predicated upon a multi-layered analytical structure that integrates cognitive psychology findings with international relations theories and climate ethics debates. Thus, the study aims to accomplish an interdisciplinary conceptual synthesis.

The fundamental hypothesis developed in parallel with the research questions posits that a significant portion of the chronic performance gaps and structural inaction in international climate governance is directly related to systematic cognitive biases. This hypothesis embraces an understanding of multiple causality while avoiding the reduction of climate governance failures to a single cause. This hypothesis offers a complementary perspective against conventional explanations that reduce climate governance failures solely to conflicts of interest or power asymmetries. Auxiliary hypotheses concretize this fundamental proposition at different levels: First, status quo bias and loss aversion encourage the perpetuation of existing policies and low targets in climate negotiations. These biases provide cognitive legitimacy for the unquestioned continuation of existing energy systems and development models. Second, temporal discounting and excessive optimism lead to the systematic underestimation of long-term climate risks and the deferral of ambitious commitments. Third, the effects of these biases can be mitigated through appropriate institutional design, transparency mechanisms, and cognitive awareness tools [11]. These hypotheses are tested and discussed through literature-based analytical evaluation in the subsequent sections of the study. Thus, the article aims to generate normative and policy-oriented implications beyond offering a descriptive explanation.

The concrete manifestations of cognitive biases in climate governance offer a powerful analytical tool for comprehending the structural problems in this domain. Status quo bias nourishes the unquestioned perpetuation of fossil fuel-based development models and existing energy policies; decision-makers systematically exaggerate the costs of change while underestimating the risks of the current state. This asymmetric evaluation assists in explaining why fundamental transformations in climate policies prove so challenging. Loss aversion causes the short-term economic costs of climate policies to overshadow the long-term environmental and societal gains [5]. Excessive optimism and the illusion of control legitimize present inaction through excessive confidence in technological solutions that will emerge in the future [9]. Particularly, exaggerated expectations toward not-yet-mature technologies such as carbon capture and storage constitute a concrete reflection of this optimism bias. Temporal discounting leads to the systematic devaluation of the long-term effects of climate change in decision-making processes [12]. These cognitive tendencies do not remain confined to the individual level; they are reproduced at the collective level through groupthink and mutual confirmation mechanisms in international conferences, summit meetings, and multilateral negotiation settings. This circumstance prepares the ground for cognitive biases to become embedded in institutional structures and to become entrenched over time.

At this juncture, the significance of the normative-analytical approach emerges more distinctly. The analytical dimension aims to explain how cognitive biases operate in climate governance processes, through which mechanisms they become effective, and under what conditions they intensify. This explanation aspires to illuminate the causal mechanisms underlying observable patterns. The normative dimension discusses what kinds of ethical problems these cognitive limitations engender in terms of democratic legitimacy, distributive justice, and intergenerational responsibility [13]. Gardiner's metaphor of the "perfect moral storm" explains how the global, intergenerational, and theoretical dimensions of climate change combine to create an ethically challenging situation. Climate change is not merely a technical policy problem but simultaneously a profound ethical matter; for the decisions of today irrevocably determine the living conditions of generations yet unborn. For this reason, the systematic inaction and delay caused by cognitive biases constitutes a serious normative problem. Particularly, the inability of future generations to be represented in decision-making processes further strengthens cognitive short-termism and deepens ethical dilemmas. The normative-analytical framework enables rendering this problem visible and evaluating it critically. Thus, the study systematically elucidates the significance that cognitive findings bear for climate ethics and policy design.

This study aims to contribute to the climate governance literature at three distinct levels. The first contribution is positioning cognitive biases as a central analytical variable of international climate governance. This positioning foregrounds a neglected dimension in climate governance research and prepares fertile ground for new research questions. The existing literature proceeds largely through material interests, power balances, and

institutional design; the perceptions, expectations, and mental frameworks of decision-makers remain at a secondary level. This study offers a systematic conceptual framework directed toward filling this gap. The second contribution is integrating behavioral findings with normative climate ethics debates. This integration enables ethical demands to be formulated in a manner consistent with the actual functioning of decision-making processes. Cognitive limitations do not eliminate ethical responsibility; however, they provide important clues regarding how this responsibility should be defined and fulfilled. The third contribution is bringing a cognitively informed perspective to policy and institutional design debates. How behavioral insights can be integrated into governance processes constitutes one of the original openings of this study. When these three contributions are evaluated together, the study positions itself as an endeavor that integrates the fragmented approaches in the existing literature and accomplishes an interdisciplinary synthesis.

Climate governance debates within international relations theories have been shaped predominantly around neoliberal institutionalism, regime theory, and multilevel governance approaches. This theoretical diversity illuminates different dimensions of climate governance while simultaneously creating a fragmented analytical landscape. These theoretical frameworks successfully explain the conditions of international cooperation, the importance of institutional design, and the interaction dynamics among actors [10,14]. Neoliberal institutionalism argues that international institutions facilitate cooperation by reducing transaction costs and diminishing information asymmetry. This approach explains the sustainability of cooperation through the information-providing, monitoring, and enforcement functions of institutions. Regime theory examines how structures composed of principles, norms, rules, and decision-making procedures shape state behavior. Multilevel governance approaches expand the analytical framework by emphasizing the increasing role of non-state actors and local governments. Nevertheless, all of these approaches mostly treat the cognitive dimension of decision-making processes at an assumptive level or exclude it entirely. Particularly, the rationality assumption increasingly contradicts the empirical reality of climate policy. The systematic deferral, target reduction, and symbolic compliance practices observed in climate negotiations cannot be adequately explained through purely interest-based explanations. This study aims to deepen and complement existing theoretical frameworks with a cognitive layer rather than rejecting them.

The behavioral international relations literature has, in recent years, made significant contributions on leader perceptions, threat assessments, and foreign policy decisions [6,7]. Robert Jervis's pioneering works have systematically revealed how perception and misperception play a determinative role in the dynamics of international conflicts. This literature systematically examines how the cognitive processes of statesmen and decision-makers influence international outcomes. Perception errors, miscalculations, and cognitive biases are analyzed across a broad spectrum from war decisions to alliance formation. These analyses contribute to the development of more realistic decision-making models by demonstrating the limitations of the rational actor model. However, the systematic adaptation of this literature to the domain of climate governance has remained quite limited. Climate change is often treated as a technical or environmental matter; cognitive and psychological dimensions are kept at a secondary level [15,16]. Yet climate change possesses cognitively extremely challenging characteristics such as abstractness, temporal remoteness, and probabilistic uncertainty. These characteristics further amplify the effect of cognitive biases and systematically distort decision-making processes. Consequently, climate governance constitutes a particularly amenable and productive field for the application of behavioral approaches. This article aims to systematize this potential at the theoretical level and to establish a durable analytical connection between the behavioral international relations literature and climate governance studies.

The institutional analysis literature has focused on explaining the decision-making processes of international organizations and regimes through formal rules. This approach emphasizes the effects of procedures, voting rules, and authority distribution on outcomes [17]. March and Olsen's new institutionalist approach treats institutions not merely as constraining structures but simultaneously as frameworks that generate meaning and shape behavior. Nevertheless, it is increasingly acknowledged that institutions are not composed solely of formal structures but also produce cognitive and normative frameworks. Institutions shape actors' perceptions of what is reasonable, possible, or legitimate and reproduce particular patterns of thought. This cognitive dimension assists in explaining why institutional change is so challenging and why existing arrangements are perpetuated without question. In this context, cognitive biases may become embedded in institutional structures and become entrenched over time. Status quo bias, in particular, renders the questioning of existing institutional arrangements difficult and creates systematic resistance against fundamental changes. The persistence of voluntary commitment-based models in climate governance can be closely associated with these institutionalized cognitive tendencies [8]. The architecture of the Paris Agreement, while providing flexibility, simultaneously prepares the ground for the normalization of low targets. Consequently, institutional analysis remains incomplete without consideration of the cognitive dimension; this study offers a conceptual opening directed toward addressing this deficiency.

The temporal dimension constitutes one of the critical domains where cognitive biases emerge most distinctly in climate governance. Climate change stands out as a unique problematic whose effects become manifest decades later and extend across an intergenerational time horizon. Because the effects of climate change mostly emerge in the long term, decision-makers tend to focus on short-term political costs. This situation is explained in the literature through the concepts of temporal discounting and future bias [12]. Temporal discounting denotes the systematic perception of future values as lower relative to present values and explains the deferral tendency in climate policies. Cognitive psychology research demonstrates that individuals and collective actors systematically underestimate future risks and disproportionately prioritize present gains. In climate governance, this tendency leads to the continuous deferral of ambitious targets and the postponement of commitments to future periods. Electoral cycles and political accountability mechanisms further strengthen this temporal bias; for decision-makers are not held directly accountable for consequences that extend beyond their terms of office. From a normative standpoint, this situation directly contradicts the principle of intergenerational justice [13]. The systematic neglect of the interests of future generations constitutes one of the most problematic normative reflections of cognitive short-termism. This study aims to address the effects of temporal biases in climate governance at both the analytical and ethical planes.

The most conspicuous research gap in the existing literature pertains to the question of how cognitive biases become institutionalized in international climate governance. This question is directly related to the problem of how individual-level cognitive findings can be transposed to the collective and institutional level. Existing studies mostly treat cognitive biases as individual decision errors and do not transpose them to the institutional level. Yet climate governance presents a complex structure that operates through collective decision-making, recurring negotiations, and established norms. These characteristics create favorable conditions for the transfer and reproduction of cognitive biases from the individual to the institutional level. These characteristics enable cognitive biases to become embedded in institutional structures and to be reproduced over time. Comprehensive and systematic analyses of how this process operates in the literature are quite limited. Similarly, the normative consequences of cognitive biases are often addressed indirectly; explicit analytical connections are not established. This deficiency creates uncertainty regarding how cognitive findings can be transferred to policy design and ethical debates. This situation weakens the explanatory power of ethical critiques and causes policy recommendations to remain groundless. Consequently, a multi-layered gap that needs to be addressed at both the analytical and normative levels is at issue. This article aims to develop an interdisciplinary and integrative conceptual framework that directly targets this gap. Thus, the study aims to transcend the fragmentation in the existing literature and render the cognitive dimension of climate governance systematically visible.

The originality of this study is not limited to treating cognitive biases merely as explanatory variables. It simultaneously makes the normative consequences of these biases a direct subject of discussion. This choice aims to consciously transcend the descriptive-normative distinction frequently observed in the climate governance literature. Cognitive errors in climate governance lead not only to effectiveness problems but also to justice and legitimacy problems. Democratic legitimacy requires decision-making processes to be justifiable in both procedural and outcome dimensions; cognitive biases systematically undermine this justification [18]. Particularly, the systematic neglect of the interests of future generations constitutes one of the most striking normative reflections of cognitive short-termism [13]. In this context, the study directly relates cognitive biases to ethical responsibility debates. Ethical responsibility depends not only on outcomes but also on the epistemic quality of decision-making processes; accordingly, awareness of cognitive limitations becomes an ethically necessary condition. Such an approach enables moving beyond technical policy analyses and jointly evaluating both how climate governance operates and how it ought to operate. This bidirectional analysis accentuates the normative-analytical character of the article and offers an original contribution to the climate ethics literature. Accordingly, the study integrates descriptive explanation with normative evaluation as a deliberate choice.

The article also opens an analytical space for policy and governance designs directed toward mitigating the effects of cognitive biases. This opening reflects an approach that is not content with merely criticizing climate governance but also develops constructive proposals. The behavioral insights literature has comprehensively demonstrated that choice architecture, framing, and feedback mechanisms can be effective on individual

behaviors [11,19]. This literature shows that intervention strategies shaped around the concept of "nudging" can guide individuals' preferences without restricting their freedoms. How these insights can be adapted to international climate governance still stands as a domain that has not been sufficiently discussed. The study aims to address this deficiency by examining cognitively informed governance designs at the conceptual level. The purpose here is not to propose a technocratic behavioral engineering; rather, it is to develop more realistic and implementable institutional frameworks that take cognitive limitations into account. In this context, the study, being aware of paternalism critiques, observes the principles of democratic participation and individual autonomy [20]. Transparency mechanisms, accountability structures, and institutional learning processes hold central importance in this context. Thus, cognitive awareness can be integrated into governance design in a manner consistent with democratic values and ethical principles. This approach enables the study to offer not only a critical but also a constructive perspective.

The interdisciplinary character of the study constitutes both its strength and its analytical challenge. The cognitive psychology, international relations, and climate governance literatures are nourished by different epistemological traditions and possess different conceptual languages. While cognitive psychology is predominantly grounded in an experimental and positivist tradition, international relations also harbors interpretive and critical approaches; climate governance, as a multidisciplinary field, further expands this diversity [10]. These differences render interdisciplinary dialogue challenging; however, they simultaneously prepare fertile ground for new conceptual syntheses. This study evaluates these differences not as an obstacle but as an opportunity for analytical enrichment. The interdisciplinary approach enables transcending the limited perspective of any single discipline and developing a more holistic and multidimensional comprehension. When the individual-level findings of cognitive psychology are brought together with the institutional and systemic analyses of international relations, it becomes possible to better comprehend the complexity of climate governance. Normative climate ethics debates add a value dimension to this analytical framework. Thus, the study aims to accomplish an original synthesis that harmonizes the conceptual tools of three different disciplines within a coherent whole. This interdisciplinary approach is evaluated as a necessary step for transcending the fragmentation in the climate governance literature.

The methodological choice of the research is predicated, in a manner consistent with this interdisciplinary objective, upon a conceptual and interpretive analysis. This choice reflects the fundamental characteristic of analytical perspective articles and aims to offer original conceptual contributions by reinterpreting existing knowledge rather than generating empirical data. The study adopts an approach that reinterprets and integrates the findings in the existing literature rather than conducting an empirical causality test. This choice enables the treatment of phenomena such as cognitive biases, which are difficult to measure directly, at the conceptual level [3]. The concept of bounded rationality offers a powerful theoretical tool for explaining the deviation of decision-making processes from the assumption of full rationality. The research conducts a systematic literature review through articles published in peer-reviewed journals and the fundamental works of the field. Acknowledged studies in the domains of international climate governance, cognitive psychology, and normative evaluation constitute the fundamental sources of the analysis. In source selection, currency, theoretical depth, and openness to interdisciplinary dialogue were adopted as fundamental criteria. These sources contribute to the clear definition of concepts and to the coherent integration of insights from different disciplines. Accordingly, the methodological approach is in complete alignment with the theoretical and normative claims of the study. This choice aims to produce generalizable explanations and to offer conceptual tools that can be reinterpreted in different contexts.

In summary, this article positions itself as a comprehensive endeavor that aims to rethink international climate governance from the perspective of cognitive biases. This rethinking offers a perspective that complements and deepens existing theoretical frameworks rather than rejecting them. The principal research question focuses on how cognitive biases shape the functioning and effectiveness of climate governance. The auxiliary questions accompanying this principal question examine which biases are more dominant, in which contexts they intensify, and how their effects can be mitigated. This series of questions constitutes a comprehensive research agenda extending from descriptive analysis to normative evaluation and policy recommendations. The fundamental hypothesis asserts that a significant portion of the chronic performance gaps in climate governance is directly related to systematic cognitive limitations. The structural problems of climate governance cannot be fully comprehended without consideration of the cognitive dimension. For this reason, the article adopts transcending the rational actor assumption as a deliberate choice and places the perceptions, expectations, and mental frameworks of decision-makers at the center of analysis. This approach is consistent with the increasingly strengthening behavioral turn in international relations and aims for the systematic application of this turn in the domain of climate governance [6]. This bridge established between cognitive psychology and the international relations literature offers an interdisciplinary contribution and opens a new analytical window for climate governance research.

The expected contributions of this study materialize at three fundamental planes. At the theoretical plane, a perspective that complements and deepens existing theoretical frameworks is offered by positioning cognitive biases as a central explanatory variable of international climate governance. This contribution proposes a more realistic decision-making model by questioning the actor assumptions of neoliberal institutionalism and regime theory [8]. At the normative plane, the cognitive foundations of the concepts of justice, legitimacy, and intergenerational responsibility are illuminated by integrating behavioral findings with climate ethics debates. This integration enables ethical demands to be formulated in a manner consistent with the actual functioning of decision-making processes. At the policy plane, the possibility and limits of cognitively informed governance designs are discussed, generating guiding implications for decision-makers and institutional designers. These implications aim to offer implementable and context-sensitive recommendations rather than abstract principles. When these three contributions are evaluated together, the study acquires meaning as an original endeavor that transcends the fragmentation in the climate governance literature and integrates analytical and normative dimensions. In the sections that follow, these conceptual foundations will be deepened with the literature review, theoretical framework, and methodological choices; thereafter, the findings, discussion, and recommendations will be systematically presented. Thus, the article aims to ground its claim of reconceptualizing international climate governance from a cognitive perspective within a coherent and comprehensive structure.

LITERATURE REVIEW

The international climate governance literature has, over the past three decades, comprehensively analyzed the conditions of interstate cooperation, the effectiveness of institutional architecture, and the dynamics of multilevel actor networks. This expansive body of scholarship examines why the struggle against climate change necessitates global collective action and to what extent existing governance structures are capable of responding to this necessity. Neoliberal institutionalism has constituted one of the fundamental theoretical frameworks in this domain by arguing that institutional arrangements facilitating state cooperation reduce transaction costs and diminish information asymmetry [14]. Regime theory has systematically examined how international principles, norms, and decision-making procedures shape state behavior. While these theoretical approaches offer powerful analytical tools for explaining why and how states cooperate in the climate domain, they encounter difficulties in elucidating why cooperation frequently proves inadequate and why commitments fail to translate into implementation. These theoretical approaches have made significant contributions to explaining the emergence and functioning of multilateral arrangements such as the Paris Agreement. Nevertheless, these explanations have mostly treated the cognitive processes and perceptual dynamics of decision-makers at an assumptive level or excluded them from analysis altogether [10]. This circumstance creates an analytical gap in explaining why climate governance remains chronically inadequate despite knowledge and scientific consensus. The fact that global emissions continue to rise despite the increasingly urgent warnings contained in Intergovernmental Panel on Climate Change reports concretely reveals the practical consequences of this analytical gap [1]. As emphasized in the Introduction, the structural problems in climate governance cannot be explained solely by material interests and institutional capacity deficiencies; the cognitive dimension emerges as an indispensable plane of analysis for understanding these structural problems.

The cognitive psychology and behavioral decision-making literature has demonstrated with robust evidence that humans deviate from rationality in systematic and predictable ways. The concept of bounded rationality assumes that decision-makers possess limited information-processing capacities and therefore prefer options that appear sufficiently good rather than optimal solutions [3]. This assumption represents a fundamental departure from classical economics' homo economicus model and provides an essential conceptual foundation for the realistic understanding of decision-making processes. The pioneering works of Kahneman and Tversky have demonstrated at the experimental level how systematic biases emerge in heuristic decision-making processes and have opened for discussion the societal consequences of these findings [2,4]. Loss aversion reveals that individuals weight potential losses disproportionately relative to potential gains; status quo bias demonstrates that systematic resistance is exhibited against change to the current state of affairs [5]. These cognitive tendencies are reproduced and become entrenched not only in individual decisions but also in collective and institutional processes. Climate governance provides a context that amplifies the effect of these biases, as it harbors long time horizons, high uncertainty, and abstract

risks. Particularly, the slow-progressing, cumulative, and difficult-to-reverse effects of climate change constitute a risk category that is far more difficult to perceive and process compared to the immediate and concrete threats to which the human cognitive system has evolutionarily adapted. Consequently, the cognitive psychology literature constitutes a fundamental conceptual resource for understanding the performance gaps in climate governance. This resource assumes a central role in answering the research question articulated in the Introduction.

The behavioral international relations literature has applied the findings of cognitive psychology to interstate decision-making and foreign policy analyses. Robert Jervis's pioneering works have systematically revealed how perception and misperception play a determinative role in the dynamics of international conflict and have offered an analytical framework that transcends the limitations of the rational actor assumption [6]. Jervis's analysis of perception and misperception has demonstrated that statesmen systematically misjudge enemy intentions and that these misjudgments escalate international tensions, thereby proving that cognitive factors cannot be neglected in international relations. Studies on leader perceptions, threat assessments, and risk calculations have examined across a broad spectrum how cognitive processes influence international outcomes [7]. This literature has demonstrated the explanatory power of cognitive factors in numerous domains from war decisions to alliance formation, from crisis management to diplomatic negotiations. Nevertheless, the systematic application of the behavioral international relations literature to the domain of climate governance has remained quite limited. Climate change has mostly been treated as a technical or environmental matter, and the cognitive processes of decision-makers have been kept in a secondary position [15,16]. Yet climate negotiations encompass interstate bargaining, risk communication, and collective commitment processes; each of these processes is susceptible to the influence of cognitive biases. The hypothesis set forth in the Introduction argues that filling this literature gap is imperative not only analytically but also normatively.

Studies examining cognitive processes in the context of climate change have predominantly concentrated on public opinion perception, individual risk assessment, and climate denialism. These investigations have examined how ordinary citizens perceive climate risks, which cognitive barriers impede changes in environmental attitudes and behaviors, and strategies for enhancing the effectiveness of climate communication [15,16,21]. The concept of psychological distance has been employed to explain how the perception of climate change as temporally, spatially, and socially remote weakens motivation for action. This concept reveals that climate change is perceived by most people as an abstract problem that will occur in the future and affect other geographies; this perception systematically weakens motivation for urgent action. Similarly, concepts such as the finite pool of worry and single action bias have demonstrated that individuals allocate limited cognitive resources to climate problems. Nevertheless, the vast majority of these studies have remained confined to the individual level; interstate negotiation processes, the decision-making dynamics of international organizations, and global governance structures have not been sufficiently examined. Yet the performance of climate governance depends not only on public support but also on the cognitive processes of decision-makers and negotiation delegations. This study aims to establish a conceptual bridge between these micro-level findings and macro-level governance analyses. This bridge delineates the position within the literature of the normative-analytical framework defined in the Introduction.

The institutional analysis literature has focused on explaining the decision-making processes of international organizations and regimes through formal rules, procedural arrangements, and authority distribution. March and Olsen's new institutionalist approach has treated institutions not merely as constraining structures but simultaneously as frameworks that generate meaning and shape behavior [17]. According to this approach, institutions function as normative and cognitive structures that define actors' identities, interests, and appropriate behavioral patterns; consequently, institutional change requires not only the transformation of material conditions but also the transformation of meaning frameworks. This approach provides an important conceptual foundation for understanding why institutional change is so challenging and why existing arrangements are perpetuated without question. Institutions shape actors' perceptions of what is possible, reasonable, or legitimate and prepare the ground for the reproduction of particular patterns of thought. Within this framework, cognitive biases may become embedded in institutional structures and become institutionalized over time. Status quo bias, in particular, assists in explaining why existing climate regimes exhibit systematic resistance against fundamental changes [8]. The persistence of voluntary commitment-based models and the normalization of low targets can be closely associated with these institutionalized cognitive tendencies. In this context, the institutional analysis literature remains incomplete without consideration of the cognitive dimension; the theoretical framework set forth in the Introduction offers an original contribution directed toward addressing this deficiency.

The temporal dimension constitutes one of the critical domains where cognitive biases manifest themselves most distinctly in the climate governance literature. Climate change stands out as a unique problematic whose effects become manifest decades later, extend across an intergenerational time horizon, and enable the deferral of today's decision costs to the future. The concept of temporal discounting denotes the systematic perception of future values as lower relative to present values and provides a central conceptual tool for explaining the deferral tendency in climate policies [12]. Decision-makers tend to focus on short-term political costs while systematically disregarding long-term climate gains. This tendency is further strengthened in democratic political systems by electoral cycles that encourage short-term thinking and by the pressure on politicians to produce tangible results within their terms of office. This situation is not confined to individual psychological vulnerabilities but is reproduced at the institutional and collective levels as well. The target deferral, low commitments, and implementation weaknesses observed in climate negotiations can be evaluated as institutional consequences of temporal biases. Hyperbolic discounting describes the tendency of individuals and collective actors to prefer small rewards in the near future over large rewards in the distant future; this tendency explains how short-term economic interests take precedence over long-term ecological sustainability in climate policies. The problem of cognitive short-termism emphasized in the Introduction directly corresponds with the temporal bias studies in the literature and strengthens the theoretical foundation of this study.

The framing effect constitutes another important conceptual tool demonstrating how cognitive processes shape policy outcomes in the climate governance literature. The presentation of the same information in different ways can significantly alter decision-makers' preferences and risk assessments [22]. In the context of climate change, whether the problem is presented in a loss frame or a gain frame emerges as a critical factor determining policy responses. For instance, presenting climate action in the framework of economic opportunity and innovation versus presenting it in the framework of economic cost and sacrifice can fundamentally differentiate attitudes toward the same policy options. Research demonstrates that loss-focused framing generally creates stronger motivation for action; however, excessively anxiety-inducing frames may lead to defensive avoidance responses [9]. In international climate negotiations, the interpretation of the same scientific data within different frames by different states and negotiating coalitions is one of the fundamental factors that renders consensus-building difficult. Developed countries mostly evaluate climate action within the economic cost framework, while small island states and vulnerable countries perceive it within the existential threat framework. These frame differences lead to systematic communication breakdowns and mutual incomprehension in negotiations. The normative-analytical approach articulated in the Introduction necessitates addressing both how these framing dynamics operate and how they can be transformed.

Groupthink and collective decision-making dynamics offer an important conceptual framework for understanding how cognitive biases are transposed from the individual to the institutional level. The concept of groupthink developed by Irving Janis explains how decision-making quality can be systematically degraded in groups exhibiting high cohesion and isolated from outside influence [23]. Janis's classic study revealed that critical thinking is suppressed in highly cohesive groups and that intra-group consensus may become detached from external reality. International climate negotiations harbor environments conducive to groupthink due to prolonged interaction, common identity formation, and norms of diplomatic courtesy. Delegations participating in the same negotiation processes for years gradually develop a shared discourse and assumption set; this circumstance renders the emergence of radical alternatives on the agenda difficult. Negotiation delegations and technical committees may over time become closed epistemic communities that accept certain assumptions without questioning them. This situation prepares the ground for the normalization of low targets and inadequate commitments through mutual confirmation mechanisms. Furthermore, confirmation bias leads negotiators to selectively process information supporting their own positions and to disregard contrary evidence. These collective cognitive dynamics necessitate moving beyond individual-level analyses in explaining why climate governance produces inadequate outcomes despite scientific consensus. The hypothesis set forth in the Introduction argues that cognitive biases become entrenched at the institutional level; this literature review reveals the conceptual resources supporting this argument.

The normative climate ethics literature has comprehensively examined the justice, equity, and intergenerational responsibility dimensions of climate governance. This literature emphasizes that climate change is not merely a technical policy problem but simultaneously a profound ethical matter [13]. Gardiner's concept of the "perfect moral storm" posits that climate change harbors simultaneous ethical challenges in global, intergenerational, and theoretical dimensions and that the combination of these challenges prepares the ground for moral intractability. The global justice perspective discusses how historical emission responsibilities, vulnerability differentials, and capacity inequalities

should be taken into account in climate policies. Intergenerational ethics examines the responsibilities that present generations bear toward future generations and how these responsibilities should be reflected in policy design. Nevertheless, the normative climate ethics literature does not sufficiently explain why these ethical demands are systematically unmet in decision-making processes. At this juncture, the cognitive perspective performs an important complementary function; for it renders visible the cognitive mechanisms underlying the neglect of ethical obligations. Particularly, the lack of representation of future generations further strengthens cognitive short-termism in decision-making processes. The normative-analytical framework articulated in the Introduction aims to reconcile ethical demands with cognitive reality and to elucidate the policy implications of this reconciliation.

The behavioral public policy literature has systematically examined intervention strategies directed toward mitigating the effects of cognitive biases. The concept of nudging denotes guiding individuals' preferences without restricting their freedoms by modifying their choice architecture and has been the subject of successful applications in various policy domains [19]. This approach, also termed libertarian paternalism, advocates interventions that facilitate but do not compel individuals to make choices consistent with their own interests. The arrangement of default options, the simplification of information presentation, and the strengthening of feedback mechanisms rank among the fundamental tools of behavioral interventions [11]. These approaches have produced positive outcomes at the national level in domains such as energy conservation, recycling, and carbon footprint reduction. However, how behavioral insights can be adapted to international climate governance has not yet been sufficiently discussed. Questions regarding how choice architecture should be arranged in interstate negotiations, which default options should be determined, and how feedback mechanisms should be operated await answers. The principle of respect for the decision autonomy of sovereign states renders the direct transfer of behavioral interventions applied at the national level to the international level difficult and necessitates original institutional designs. This study aims to discuss at the conceptual level the possibilities and limits of the behavioral public policy literature's adaptation to the international level. The policy-level contribution objective articulated in the Introduction is predicated upon cognitively informed governance designs grounded in this literature review.

The literature on decision-making under uncertainty provides a fundamental conceptual resource for understanding the cognitive dimension of climate governance. Climate change, by its very nature, creates an uncertainty-intensive decision environment predicated upon probabilistic projections, complex feedback loops, and long-term scenarios. Frank Knight's classic distinction between risk and uncertainty still retains its validity for comprehending the epistemic challenges confronting climate policies [24]. Risk denotes situations where probability distributions are known; uncertainty describes conditions where these distributions themselves are unknown. While climate change harbors both situations, it contains scenarios that particularly fall into the category of deep uncertainty. The concept of deep uncertainty denotes situations where the possible outcomes concerning the future, the probabilities of these outcomes, and even the decision variables themselves cannot be fully known; the tipping points and cascade effects of the climate system are evaluated within this category. Decision-makers resort to heuristic shortcuts to cope with this uncertainty; these shortcuts lead to systematic biases [2]. The representativeness heuristic causes decision-makers to over-interpret extreme weather events experienced recently as evidence of climate change or to underestimate risks in the absence of such events. The availability heuristic leads to easily recalled information acquiring disproportionate weight in decision processes. These cognitive dynamics render the consistent transfer of climate knowledge to policy processes difficult and explain the "inaction despite knowledge" paradox emphasized in the Introduction.

The multilevel governance literature has revealed that climate policy is not confined to interstate negotiations and encompasses the complex interactions of various actor categories. This approach has incorporated into the analytical framework a broad spectrum of actors extending from local governments to supranational organizations, from private sector initiatives to civil society networks [10]. This perspective has foregrounded the importance of multi-actor and multi-scale governance structures by emphasizing the inadequacy of state-centric and top-down models of climate governance. The multilevel governance perspective argues that decentralized and flexible governance structures can facilitate climate action. Nevertheless, this approach does not sufficiently examine the cognitive processes of actors at different levels and the interactions of these processes. Questions regarding how local administrators, supranational bureaucrats, and civil society representatives perceive climate risks, within which cognitive frames they evaluate them, and to which biases they are subject in decision-making processes remain largely unanswered. Yet the effectiveness of multilevel governance depends on cognitive alignment among different actor categories and on the ability to establish common meaning frameworks. This study aims to enrich the multilevel governance literature with a cognitive layer and to discuss the conditions of inter-actor cognitive coordination.

Excessive optimism and the illusion of control explain the cognitive foundations of excessive confidence in technological solutions and the legitimization of present inaction in climate governance. The excessive optimism bias denotes the tendency of individuals and collective actors to believe that negative outcomes will not befall them or that solutions will be found in the future [9]. This bias is also related to the concept of "moral hazard"; the belief that technological solutions will be found in the future diminishes the urgency of present emission reduction efforts and legitimizes inaction. This tendency prepares the ground for the proliferation of technological savior expectations in climate policies and for the deferral of emission reductions to the future. Carbon capture and storage, solar radiation management, and other geoengineering technologies are frequently presented as alternative solutions in policy discourses despite not yet being proven. The illusion of control leads decision-makers to exaggerate their control capacity over complex systems and to underestimate unexpected consequences. In complex and non-linear systems such as the climate system, the fact that small interventions may produce unforeseeable large consequences is systematically underestimated due to the illusion of control. These cognitive tendencies explain why ambitious long-term targets in climate negotiations are not supported by short-term concrete actions. The hypothesis articulated in the Introduction argues that these cognitive biases are directly related to the chronic performance gaps in climate governance; the literature review reveals the conceptual foundations of this relationship.

The critical evaluation of the existing literature reveals that significant gaps exist in the application of cognitive approaches to climate governance. First, the connections between individual-level cognitive findings and collective and institutional-level processes have not been sufficiently theorized. This micro-macro connection problem constitutes one of the fundamental methodological challenges of the social sciences and necessitates multilevel analysis frameworks for understanding the societal consequences of cognitive biases. Questions regarding how cognitive biases are transposed from individual decision-makers to negotiation delegations and thence to institutional structures, and how they are transformed in this process, await answers. Second, the behavioral international relations literature has concentrated on security and conflict issues; environmental collective action problems such as climate governance have been relatively neglected [6]. Third, a systematic dialogue between normative climate ethics and behavioral findings has not been established. Ethical demands are mostly formulated assuming ideal conditions; the actual cognitive limitations of decision-makers are not taken into account [13]. Fourth, the behavioral public policy literature has remained confined to the national level; the possibilities of adaptation to international governance have not been sufficiently investigated. These four gaps delineate the domains where the present study can offer an original contribution to the literature and shape the analytical agenda of the research. These gaps delineate the domains where the present study can offer an original contribution to the literature.

This literature review reveals that cognitive biases constitute a central conceptual resource in efforts to understand and transform international climate governance. The cognitive psychology, behavioral international relations, institutional analysis, normative climate ethics, and behavioral public policy literatures provide a rich conceptual accumulation that illuminates different dimensions of climate governance. Nevertheless, the systematic integration of these literatures and their application to climate governance within a comprehensive framework has not yet been accomplished. This fragmentation limits both analytical explanatory capacity and weakens the coherence of policy recommendations. The present study aims to transcend the fragmentation in the literature by undertaking this synthesizing endeavor. The research question articulated in the Introduction will be addressed on the basis of this literature. The fundamental hypothesis posits that a significant portion of the performance gaps in climate governance is related to systematic cognitive biases. The auxiliary questions examine which biases are more dominant, in which contexts they intensify, and how their effects can be mitigated. In the ensuing theoretical framework section, the conceptual tools derived from this literature review will be transformed into a systematic analytical structure.

The conceptual accumulation revealed by the literature review clearly demonstrates that the cognitive dimension of climate governance must be addressed with a multilayered and interdisciplinary perspective. This multilayeredness requires not merely the integration of different disciplines but also the simultaneous analysis of individual, organizational, and systemic levels. Bounded rationality theory provides an analytical foundation that transcends the limitations of the rational actor assumption by revealing that decision-makers tend toward satisficing options rather than optimal solutions [3]. The cognitive biases literature concretely identifies within which systematic

patterns these limitations manifest themselves. The behavioral international relations approach demonstrates how these individual-level findings can be applied to interstate interactions [6]. The institutional analysis perspective offers an indispensable analytical tool for understanding how cognitive biases become entrenched and reproduced at the structural level [17]. Normative climate ethics enables the evaluation of what kinds of problems these cognitive dynamics engender in terms of justice, equity, and intergenerational responsibility [13]. The behavioral public policy literature, finally, discusses the possibilities and limits of intervention strategies directed toward mitigating the effects of cognitive biases [11]. This study aims to offer an original conceptual contribution to climate governance by bringing together these different literatures within a comprehensive framework.

This literature review delineates the original position of the present study along three fundamental axes. On the first axis, cognitive biases are positioned as a central explanatory variable of international climate governance. This positioning elevates cognitive factors from marginal or complementary variables to the focal point of analysis and brings a new analytical perspective to the climate governance literature. The existing literature mostly treats cognitive factors as secondary or complementary variables; this study, by contrast, places the cognitive dimension at the center of analysis. On the second axis, analytical explanation and normative evaluation are systematically integrated. Studies in the literature generally adopt either a descriptive or a normative approach; this study proposes a normative-analytical framework that consciously brings both dimensions together. This integration enables the simultaneous evaluation of both how climate governance operates and how it ought to operate. On the third axis, behavioral findings are related to policy and governance design recommendations. While behavioral studies in the literature mostly remain confined to the individual or national level, this study discusses the possibility of cognitively informed designs at the international governance level. The three-level contribution objective set forth in the Introduction directly corresponds with this literature positioning and determines the analytical trajectory of the research.

In conclusion, this literature review reveals that the reconceptualization of international climate governance from the perspective of cognitive biases is predicated upon robust justifications both analytically and normatively. This reconceptualization positions itself as a perspective that complements, deepens, and grounds existing theoretical approaches upon a more realistic actor model rather than rejecting them. While existing theoretical approaches make important contributions to explaining the structural problems in climate governance, they do not sufficiently incorporate the cognitive processes of decision-makers. The cognitive psychology and behavioral decision-making literature offers a rich conceptual toolkit for addressing this deficiency. The behavioral international relations approach demonstrates how these tools can be applied to interstate interactions. The normative climate ethics literature enables the evaluation of the ethical implications of cognitive findings. The behavioral public policy literature discusses the possibilities and limits of intervention strategies. The systematic synthesis of these different branches of literature holds the potential to bring both an explanatory and a transformative perspective to climate governance research. This literature review has prepared the necessary conceptual foundation for the ensuing theoretical framework section. In the theoretical framework section, these conceptual tools will be transformed into a systematic analytical structure and the relationships among the fundamental concepts of the study will be explained at the theoretical level. Thus, the conceptual bridge extending from the literature review to the theoretical framework will be completed.

THEORETICAL FRAMEWORK

The research question set forth in the Introduction and the theoretical gaps identified in the literature review necessitate the construction of a theoretical framework that systematically addresses the cognitive dimension of international climate governance. The fundamental purpose of this theoretical framework is to position cognitive biases as a central explanatory variable of climate governance and to elucidate both the analytical and normative implications of this positioning. It has been previously demonstrated that existing theoretical approaches explain climate governance predominantly through institutional design, conflicts of interest, and power balances [8,10]. While these explanations offer significant contributions to understanding the conditions of international cooperation and regime dynamics, they mostly treat the cognitive mechanisms of decision-making processes at an assumptive level or neglect them altogether. Dominant approaches such as neoliberal institutionalism and regime theory take the preferences and behaviors of actors as given and refrain from interrogating how these preferences are formed and through which cognitive processes they are shaped [25]. Yet climate change constitutes a distinctive policy domain harboring high uncertainty, extending across long time horizons, and containing abstract risks; these characteristics render the exclusion of cognitive processes from analysis unacceptable [2]. Within this framework, the study develops a theoretical model that, rather than wholly rejecting the rational actor assumption, complements it with cognitive limitations and thereby expands its explanatory capacity. This epistemological position reflects a pragmatic stance that bridges positivist and interpretive approaches; it embraces both an explanatory and an understanding-oriented perspective. This model provides a consistent foundation at both the analytical and normative levels for comprehending why climate governance experiences a chronic performance problem.

The first and foundational component of the theoretical framework is the concept of bounded rationality. Developed by Herbert Simon, this concept posits that decision-makers cannot process all information in a complete manner and instead resort to cognitive heuristics and intuitive methods [3]. The fundamental rationale for selecting this concept is that the characteristic features of climate governance concretely reflect the conditions of bounded rationality; scientific uncertainty, political complexity, and temporal remoteness constitute the structural obstacles to optimal decision-making. Bounded rationality assumes that humans in complex decision environments tend toward options that appear "sufficiently good" rather than seeking optimal solutions; this situation is acknowledged as an inherent feature of decision-making. In the context of climate governance, this assumption is particularly determinative; for climate policies are shaped amid scientific uncertainties, technical complexities, and political cost calculations. The assumption of full rationality, which could be considered as an alternative, manifestly contradicts the empirical reality of climate governance; if actors were fully rational, the systematic inaction and inadequate commitments observed despite scientific consensus could not be explained [18]. Decision-makers, under these conditions, exhibit a systematic tendency to prefer cautious and short-term options. This tendency constitutes a significant explanatory source for the structural delays and inadequate commitments in climate governance. The bounded rationality perspective enables analyzing climate governance as the predictable and systematic consequence of cognitive limitations rather than judging it as an irrational failure. Thus, priority is accorded to analytical explanation over normative judgments, and the source of structural problems can be diagnosed more accurately.

The second component of the theoretical framework is the typological classification of cognitive biases and their association with climate governance processes. The cognitive psychology literature has identified numerous systematic biases that emerge in decision-making processes and has revealed the universal patterns of these biases [2,4]. The selection of those most directly related to climate governance from among the hundreds of cognitive biases identified in this literature has been a necessary choice for ensuring analytical focus and theoretical coherence. Drawing upon this rich literature, this study focuses on three bias groups most determinative for climate governance: status quo bias, loss aversion, and temporal biases. Status quo bias denotes the systematic preference for the current state and established policy arrangements over alternatives involving change; this situation prepares the ground for the unquestioned perpetuation of fossil fuel-based development models. This bias is closely related to the endowment effect and loss aversion and is explained by the current state becoming a psychological reference point [4]. Loss aversion encompasses the psychological perception of potential losses as weightier than equivalent gains; this tendency leads short-term economic costs to take precedence over long-term climate benefits. Temporal biases encompass the systematic undervaluation of future outcomes relative to present outcomes; this situation contributes to the continuous deferral of climate risks to the future [12]. This tendency, also termed hyperbolic discounting, significantly reduces the present perceptual weight of future harms and weakens motivation for urgent action. When these three bias types are considered together, the cognitive foundations of chronic inaction in climate governance become visible in a multidimensional manner.

The third component of the theoretical framework is the assumption that cognitive biases are not confined to individual decision-makers but are reproduced at the institutional and collective levels. This assumption directly addresses the question of how micro-level psychological findings can be adapted to macro-level international relations analysis; this cross-level transition is legitimized by the behavioral international relations literature [6,7]. International climate governance possesses a complex structure that operates through recurring negotiations, established norms, institutionalized procedures, and mutual expectations. These structural characteristics facilitate the embedding of cognitive biases in institutional structures and their entrenchment over time [17]. For instance, the persistent maintenance of climate regimes based on voluntary commitments can be evaluated as an institutional reflection of status quo bias; these regimes exhibit systematic resistance against more binding alternatives. The concept of institutional path dependence explains how this resistance becomes entrenched; decisions taken in the past narrow future options and render change increasingly costly. Similarly, discourses of "incremental progress" and "small steps" normatively legitimize temporal

biases and render the deferral of ambitious targets acceptable. International conferences and summits create environments susceptible to groupthink and mutual confirmation mechanisms; these environments prepare the ground for the collective endorsement of low targets and inadequate commitments [9]. Within this framework, cognitive biases are treated not merely as psychological tendencies but as mechanisms inherent in the functioning of governance architecture and institutionally reproduced. This assumption constitutes one of the fundamental underpinnings of the original and integrative character of the theoretical framework.

The fourth component of the theoretical framework is the systematic establishment of the relationship between cognitive biases and normative consequences. The normative-analytical approach emphasized in the Introduction acquires concrete content at this juncture. This approach moves beyond mere descriptive analysis to consciously interrogate the relationship between "what is" and "what ought to be"; thereby bringing a critical dimension to climate governance studies. Cognitive biases in climate governance affect not only policy effectiveness but also the principles of justice, legitimacy, and intergenerational responsibility directly [13]. The intergenerational justice problem, in particular, clearly reveals the normative reflections of temporal biases; the interests of future generations are systematically relegated to the background in decision-making processes, and this situation constitutes a serious ethical problem. This ethical problem should be evaluated not only in terms of distributive justice but also procedural justice; the inability of future generations to be represented in decision-making processes also undermines principles of democratic legitimacy [26]. The systematic underestimation of future harms by decision-makers should be evaluated not merely as policy failure but simultaneously as a normative violation. For this reason, the theoretical framework consciously brings together explanatory analysis and normative evaluation. It is argued that cognitive limitations do not eliminate normative responsibility but provide fundamental clues regarding how this responsibility should be understood and addressed. This approach makes it possible to address climate governance comprehensively in terms of both "how it operates" and "how it ought to operate" and concretizes the normative-analytical claim of the article at the theoretical level.

The fifth component of the theoretical framework is the differentiation of the effects of cognitive biases across different actor types. International climate governance does not consist of a homogeneous set of actors; states, international organizations, and negotiating coalitions possess different cognitive and institutional dynamics. This actor typology has been developed in a manner consistent with the analytical framework offered by the multilevel governance literature and aims to render visible the distinctive cognitive dynamics of each actor category [10,27]. This actor diversity necessitates assuming that the manifestation forms and intensities of cognitive biases vary according to context. States are structurally more prone to short-term thinking due to domestic political pressures, electoral cycles, and public opinion expectations; this situation strengthens the effect of temporal biases and loss aversion on state behavior [12]. International organizations possess the capacity to counterbalance certain cognitive limitations thanks to their accumulation of technical expertise and bureaucratic continuity; however, these organizations may also remain susceptible to institutional inertia and procedural status quo bias [17]. Negotiating coalitions, as temporary alliances formed around common interests, represent environments where collective cognitive dynamics intensify. These coalitions function as platforms where common cognitive frameworks are constructed and consolidated, as observed in examples such as the Alliance of Small Island States or the group of fossil fuel exporters. This differentiation at the actor level enables analyzing the cognitive dimension of climate governance in a more nuanced and realistic manner.

In the context of state actors, cognitive biases become effective particularly through how the perception of national interest is constructed and how policy options are framed. National interest is a concept defined through cognitive and normative frameworks rather than being an objective datum and is therefore open to perceptual processes [6]. As constructivist international relations theory emphasizes, interests are socially constructed, and cognitive frameworks play a determinative role in this construction process. In climate policies, status quo bias leads to the perception of existing economic models and energy systems as "natural" or "inevitable"; this perception prepares the ground for alternatives requiring fundamental transformation to be excluded from the political agenda. Loss aversion causes the excessive emphasis of short-term economic losses in fossil fuel-based sectors; this emphasis results in the systematic disregard of long-term climate benefits and risk avoidance [9]. The tendency toward uncertainty avoidance leads ambitious policy options to be perceived as politically risky and costly. The concept of psychological distance explains how the temporal, spatial, and social perception of climate change as remote strengthens this perception of uncertainty [15,16,21]. The combined effect of these cognitive tendencies explains why states adopt low-profile, cautious, and defensive positions in international climate negotiations. The theoretical framework posits that these behavioral patterns are systematic consequences of cognitive limitations rather than merely rational interest calculations.

In the context of international organizations and climate regimes, cognitive biases emerge at a different level and through different mechanisms. These actors are predicated upon collective and bureaucratic structures rather than individual decision-makers and operate through institutional memory, established procedures, and organizational routines. Contrary to what Weber's model of rational bureaucracy predicts, these bureaucratic structures are not independent of cognitive limitations; rather, they possess the capacity to institutionalize and reproduce these limitations. These structural characteristics allow certain cognitive frameworks to become institutionalized in decision-making processes and to be reproduced across generations. Particularly, the transformation of decisions taken in the past and accepted compromises into reference points entrenches status quo bias at the institutional level [8]. Core climate regimes such as the United Nations Framework Convention on Climate Change and the Paris Agreement provide concrete examples of these institutional dynamics; the persistent maintenance of structures based on voluntary commitments reflects institutional resistance against more binding alternatives. The concept of regime complexity explains how this resistance becomes entrenched; multiple overlapping and sometimes contradictory regimes strengthen status quo bias by increasing coordination costs [8]. Similarly, discourses of "incremental progress," "realistic targets," and "adaptation to national circumstances" normatively legitimize temporal biases and marginalize demands for ambitious transformation. The theoretical framework does not view international organizations as rational actors independent of cognitive biases; rather, it assumes that these organizations are cognitively structured and historically conditioned institutional actors.

Negotiating coalitions and collective decision-making environments constitute dynamic fields where cognitive biases intensify and are mutually reinforced. International climate negotiations are complex social environments where state representatives, experts, and civil society actors interact; these environments are susceptible to groupthink, social conformity pressure, and mutual confirmation mechanisms. Janis's groupthink theory explains how these dynamics operate; the suppression of critical thinking and the marginalization of alternative perspectives are systematically observed in highly cohesive groups. Groupthink may lead coalition members to avoid critical evaluations and suppress alternative perspectives in order to preserve cohesion. Confirmation bias causes negotiators to selectively process information supporting their own positions and to disregard contrary evidence. Mutual confirmation mechanisms prepare the ground for the collective normalization of low targets and inadequate commitments; one actor's cautious stance legitimizes similar stances by others, and this situation produces a cumulative cycle of inaction [9]. This cycle explains the "lowest common denominator" outcomes observed in climate negotiations; each actor legitimizes their own cautious stance by reference to the cautious stances of others. These collective cognitive dynamics necessitate moving beyond individual-level analyses in explaining why climate governance continuously produces inadequate outcomes despite scientific consensus and mounting societal pressures. The theoretical framework explicitly incorporates this collective dimension and thereby offers a multilevel analytical structure.

In light of the components developed above, the theoretical model is structured around three fundamental propositions. The first proposition is that the decision-making processes of international climate governance actors are systematically shaped by bounded rationality and cognitive biases; this proposition forms the foundation of a more realistic actor model that transcends the rational actor assumption. This proposition is consistent with the fundamental theses of the behavioral international relations literature and represents the systematic application of this literature to the domain of climate governance [7]. The second proposition is that cognitive biases do not remain solely at the individual level but become entrenched in institutional and negotiating contexts; this proposition emphasizes the structural and historical dimension of cognitive factors and reveals how governance architecture is cognitively structured [8,17]. The third proposition is that cognitive mechanisms produce normatively problematic outcomes; temporal biases, in particular, lead to the continuous deferral and neglect of the interests of future generations, resulting in the systematic violation of intergenerational justice principles [12,13]. These three propositions are not independent of one another but exhibit a mutually connected and reinforcing structure; individual cognitive limitations become entrenched at the institutional level, and this entrenchment deepens normative problems. When these three propositions are considered together, why climate governance experiences a chronic performance problem can be explained in a more comprehensive and multilayered manner. The theoretical framework explains this problem neither through mere lack of will nor solely through power relations; instead, it demonstrates how cognitive limitations interact with governance processes and what structural consequences this interaction produces.

The conceptual architecture of the theoretical framework requires the systematic explication of the relationships among the three fundamental building blocks. The concepts of international climate governance, cognitive biases, and normative-analytical

evaluation defined in the Introduction function within this framework as analytical layers that complement and mutually illuminate one another. This conceptual architecture represents an interdisciplinary synthesis; it brings together the cognitive psychology, international relations theory, institutional analysis, and normative ethics literatures within an integrated framework. The concept of international climate governance denotes the totality of institutional and normative structures that regulate the struggle against climate change through intergovernmental negotiations, multilateral agreements, and multilevel actor networks [10]. This definition distinguishes governance from the concept of government and provides a broad framework encompassing the role of non-state actors, international organizations, and civil society. The concept of cognitive biases encompasses mental tendencies that engender systematic deviations in the information-processing operations of individuals and collective actors; this concept describes the evolutionary and functional products of cognitive limitations rather than irrationality [4]. This definition conceptualizes cognitive biases not as pathological deviations but as structural features of human cognition; thereby a non-judgmental analytical perspective is adopted. Normative-analytical evaluation denotes an integrative perspective that both describes how current governance practices operate and evaluates how they ought to operate. The intersection of these three conceptual building blocks renders the cognitive dimension of climate governance visible and opens for discussion the normative consequences of this dimension.

The analysis of the relationships among concepts delineates the analytical power of the theoretical framework. The relationship between cognitive biases and international climate governance possesses a constitutive rather than causal character; cognitive biases are conceived not as directly determining governance processes but as mechanisms operating within and shaping these processes. This constitutive ontology, differing from positivist conceptions of causality, emphasizes mutual constitution; cognitive factors and institutional structures mutually shape one another. This constitutive relationship affects how governance actors perceive the world, how they evaluate risks, and how they frame options. The relationship between cognitive biases and normative evaluation exhibits a more complex structure; cognitive limitations do not eliminate ethical obligations but offer important implications regarding how these obligations should be understood and fulfilled [13]. The relationship between international climate governance and normative evaluation requires the continuous interrogation of governance practices in terms of justice, legitimacy, and effectiveness criteria. This interrogation encompasses subjecting not only outcomes but also processes to normative evaluation; the principles of procedural justice and democratic legitimacy gain importance in this context. This triadic conceptual relationship network constitutes the comprehensive character of the theoretical framework and offers an analytical structure that transcends fragmented explanations.

The applicability of the theoretical framework raises the question of how cognitive biases can be observed and analyzed in climate governance processes. This framework aims to develop conceptual explanation rather than to conduct empirical measurement; accordingly, analytical applicability is defined through observable indicators and patterns. This approach is consistent with the interpretive tradition of qualitative research methodology and aims to reveal context-specific meaning patterns rather than seeking generalizable laws. Among the indicators of status quo bias can be counted persistent attitudes toward existing policy arrangements, systematic resistance against proposals for change, and the dominance of "proven methods" discourse. The indicators of loss aversion can be identified as the excessive emphasis on short-term economic costs, the more intensive discussion of potential losses relative to gains, and cautious attitudes avoiding risk-taking. The indicators of temporal biases emerge as the continuous deferral of long-term targets, the dominance of "incremental progress" discourse, and concerns regarding future generations remaining at an abstract level [12]. These indicators possess a traceable quality through climate negotiation records, policy documents, and public statements. Discourse analysis and content analysis techniques offer appropriate methodological tools for the systematic identification of these indicators. The theoretical framework provides a conceptual map for the systematic evaluation of these indicators and thereby concretizes its analytical applicability.

An important dimension of the theoretical framework is that it opens for discussion the governance design possibilities directed toward mitigating the effects of cognitive biases. The behavioral public policy literature has demonstrated that it is possible to guide individuals' preferences without restricting their freedoms by modifying their choice architecture [11,19]. This approach, termed libertarian paternalism, advocates interventions that facilitate but do not compel individuals to make choices consistent with their own interests and holds the potential for adaptation to the international level. This approach is implemented through tools such as the arrangement of default options, the simplification of information presentation, and the strengthening of feedback mechanisms. How these insights can be adapted to the context of international climate governance determines the transformative potential of the theoretical framework. Transparency mechanisms can enhance accountability by rendering decision-makers' commitments and performance visible; this situation may render the legitimization of status quo bias difficult. The Paris Agreement's transparency framework and global stocktake mechanism constitute concrete examples of institutional efforts in this direction. Long-term impact assessments and intergenerational accountability tools may counterbalance the effects of temporal biases. Independent scientific advisory mechanisms may limit the effects of confirmation bias and groupthink. The important point to be emphasized here is that these proposals do not carry the purpose of technocratic "behavioral engineering"; rather, governance frameworks that take cognitive limitations into account, are normatively legitimate, and are consistent with democratic values are being proposed. This approach, while critical, offers a constructive perspective and concretizes the policy design dimension of the theoretical framework.

The normative dimension of the theoretical framework requires the in-depth discussion of the effects of cognitive biases on principles of justice and legitimacy. Climate change constitutes not merely a technical policy problem but simultaneously a multilayered normative domain harboring fundamental ethical matters such as global justice, intergenerational responsibility, and ecological integrity. This multilayeredness is conceptualized in the climate ethics literature as the "triple challenge"; the dimensions of global, intergenerational, and ecological justice complicate one another. Gardiner's concept of the "perfect moral storm" posits that climate change harbors simultaneous ethical challenges in global, intergenerational, and theoretical dimensions and that the combination of these challenges prepares the ground for moral intractability [13]. The cognitive biases perspective renders visible the explanatory foundations of this normative impasse; when temporal biases combine with the lack of representation of future generations, they lead to the systematic neglect of intergenerational justice. Loss aversion contributes to the disregard of the climate vulnerabilities of Global South countries and the deferral of historical emission responsibilities. The principle of common but differentiated responsibilities, while offering a normative framework directed toward addressing this injustice, is systematically obstructed in its implementation by cognitive biases. Status quo bias causes existing unjust arrangements to be perceived as "natural" or "inevitable." The theoretical framework, by revealing the cognitive foundations of these normative problems, enables ethical critiques to rest on an analytically stronger foundation. This approach prevents normative demands from remaining at an abstract level and brings a realistic dimension to climate ethics debates.

The limits and scope of the theoretical framework should be clearly delineated as a matter of academic integrity, and how these limits affect the validity of the framework should be discussed. This self-reflexive stance constitutes one of the fundamental principles of qualitative research; it requires the researcher to explicitly acknowledge their own position and the potential effects of their choices. The theoretical model developed does not position cognitive biases as the sole determinant of climate governance; rather, it presents them as a complementary explanatory layer operating in interaction with power relations, material interests, and institutional structures. This position forestalls reductionist critiques and enables the theoretical framework to be utilized in a manner consistent with existing theoretical approaches. Particularly, the potential for dialogue with different theoretical traditions such as neoliberal institutionalism, constructivism, and critical theory enhances the analytical flexibility of the framework. While the concepts of bounded rationality and cognitive biases have been developed predominantly at the individual level, in this study they have been adapted to the institutional and collective levels; this adaptation entails a certain degree of departure from the concepts' original contexts. However, the institutional analysis literature and the behavioral international relations approach demonstrate that this cross-level transition can be accomplished legitimately and productively [6,17]. Another limit of the theoretical framework is its prioritization of conceptual explanation over empirical testing; while this choice limits the generalizability of findings, it strengthens theoretical depth and analytical coherence. The explicit acknowledgment of these limits enhances the academic credibility of the framework and prepares a productive foundation for future research.

The original contributions that the theoretical framework offers to the literature materialize at three fundamental levels. At the first level, cognitive biases are positioned as a central analytical variable of international climate governance; this positioning elevates cognitive factors from marginal or complementary variables to the focal point of analysis. This positioning represents a cognitive turn in the climate governance literature; it symbolizes the transition from approaches that take actors' preferences as given to approaches that interrogate how these preferences are formed. As demonstrated in the literature review, existing theoretical approaches mostly treat the cognitive dimension of decision-making processes at a secondary level or neglect it altogether; this study systematically fills this analytical gap. At the second level, analytical explanation and normative evaluation are consciously and coherently integrated; this integration enables

the simultaneous evaluation of both how climate governance operates and how it ought to operate [13]. This integration enables climate governance studies to open from mere technical analysis toward normative interrogation; thereby the societal responsibility of research is emphasized. At the third level, behavioral findings are related to policy and governance design recommendations; this relation ensures that critical analysis is complemented by constructive proposals [11]. The three-level contribution objective set forth in the Introduction directly corresponds with this theoretical framework and determines the analytical trajectory of the study. These original contributions hold the potential to produce an enduring conceptual opening in the climate governance literature.

The comprehensive evaluation of the theoretical framework reveals the analytical coherence and normative validity of the model developed. The concept of bounded rationality, the cognitive bias typology, institutional entrenchment mechanisms, actor-level differentiation, and normative connection layers function as analytical building blocks that complement and mutually reinforce one another. The relationships among these building blocks constitute not a linear causal chain but a complex system containing mutual constitution and feedback loops. These building blocks explain the chronic performance problems in climate governance neither through mere lack of will nor solely through power relations; instead, they demonstrate how cognitive limitations interact with governance processes and what structural and normative consequences this interaction produces. The theoretical model simultaneously offers a conceptual foundation for cognitively informed governance designs and thereby harbors transformative potential. The research question formulated in the Introduction will be systematically addressed through this theoretical framework; the fundamental hypothesis posits that a significant portion of the performance gaps in climate governance is related to systematic cognitive biases. This hypothesis contains testable propositions and provides a concrete framework for future empirical research. The validity of this hypothesis will be evaluated at the analytical level in the ensuing sections. The theoretical framework provides the necessary conceptual tools and analytical structure for this evaluation.

In conclusion, the theoretical framework developed provides a coherent, systematic, and multilayered foundation for rethinking international climate governance from the perspective of cognitive biases. Rather than rejecting the structural and actor-centered explanations dominant in the climate governance literature, this framework enriches them with a cognitive layer and thereby offers a more comprehensive analytical perspective. This framework addresses climate governance not merely in terms of "why it fails" but in terms of "through which cognitive mechanisms this failure is produced." Thereby, normative critiques are placed on an analytically more robust foundation, and policy recommendations rest on more realistic grounds. The theoretical model holds the potential to unite fragmented explanations and accomplish an interdisciplinary synthesis; the cognitive psychology, international relations, institutional analysis, and normative ethics literatures are integrated within this framework. This interdisciplinary synthesis responds to the increasing complexity of climate governance research and offers a comprehensive perspective that transcends fragmented disciplinary viewpoints [18]. In the ensuing Research Methodology section, how this theoretical framework has been transformed into an analytical examination will be explained in detail. The methodology employed aims to systematically evaluate the theoretical propositions developed and to demonstrate the analytical applicability of the conceptual framework. Thus, a coherent, transparent, and traceable connection is established between theory and method; the integrity of the study is secured.

Research Methodology

This study pursues a conceptual and analytical path for reconceptualizing international climate governance from the perspective of cognitive biases. This path reflects the fundamental characteristics of the analytical perspective article genre; it aims to offer conceptual contributions by reinterpreting existing knowledge rather than collecting original data. The research question set forth in the Introduction is directed toward understanding how cognitive biases shape the functioning of climate governance. To answer this question, numerical measurements or survey applications have not been employed. Instead, the integration and interpretation of knowledge produced across different domains has been preferred. This preference aligns with the fundamental principle of the interpretive research tradition; this tradition foregrounds understanding and explaining social phenomena rather than measuring them [28]. This preference directly corresponds with the purpose of the study; for the aim is to explain and understand, not to measure. The three fundamental propositions developed in the Theoretical Framework section constitute the point of departure for this methodological approach. Concepts such as bounded rationality and cognitive biases describe mental processes that are difficult to observe directly [3]. For this reason, conceptual analysis offers the most appropriate path for answering the research question. Thus, the methodology has been formulated in complete alignment with the normative-analytical character of the article.

The fundamental sources upon which the research is predicated consist of academic studies published in the domains of international climate governance, cognitive psychology, and normative climate ethics. As indicated in the Literature Review section, these three domains constitute the conceptual foundation of the study. This interdisciplinary source structure has been evaluated as a necessary choice for comprehending the multidimensional nature of climate governance; the limited perspective of a single discipline is insufficient to explain this complex phenomenon comprehensively. In source selection, articles published in peer-reviewed journals and books acknowledged as foundational works in their fields have been prioritized. Currency has also been adopted as an important criterion; particular attention has been paid to studies published in recent years. The concurrent utilization of sources from different disciplines has prevented adherence to a single perspective. While the cognitive psychology literature illuminates decision-making processes at the individual level, the international relations literature demonstrates how these processes are reflected in interstate interactions [6]. The normative climate ethics literature discusses what these findings signify in terms of justice and responsibility [13]. The behavioral public policy literature has also been evaluated as an important source demonstrating how cognitive biases can be reflected in governance design. This multifaceted source structure supports the interdisciplinary character of the study. The selected sources have contributed to the clear definition of concepts and the coherent integration of different perspectives.

The fundamental approach pursued in the study is conceptual analysis and thematic classification. This approach possesses the fundamental characteristics of qualitative research methods; it is predicated upon analysis through concepts, patterns, and meanings rather than numerical data. First, the fundamental concepts frequently encountered in the cognitive biases literature were identified. Concepts such as status quo bias, loss aversion, temporal biases, and excessive optimism are the product of this identification [4,12]. Subsequently, with which processes these concepts are related in the context of international climate governance was examined. For instance, status quo bias has been employed to explain why low targets repeatedly emerge on the agenda in climate negotiations. Similarly, temporal biases have been evaluated in understanding why long-term climate dangers are continuously deferred. Furthermore, the concepts of excessive optimism and the illusion of control have been addressed to explain how present inaction is legitimized through the deferral of technological solutions to the future. This thematic approach has rendered complex theoretical discussions more comprehensible. Concepts have not been left at an abstract level; they have been concretely related to governance practices. Thus, the methodology has assumed an explanatory function. This approach is directly connected to the three propositions presented in the theoretical framework.

Causal testing or numerical comparison has not been conducted in the study. Instead, recurring patterns and explanations in the literature have been carefully evaluated. This preference reflects an interpretive understanding effort rather than a positivist search for causality; the aim is to comprehend how processes operate, not to measure the relationships among variables. This preference stems from the fact that the purpose of the research is sense-making rather than verification. The hypothesis articulated in the Introduction posits that the performance gaps in climate governance are related to cognitive biases. Rather than collecting numerical data to test this hypothesis, a conceptual evaluation has been conducted by integrating findings from different studies. Since mental processes such as cognitive biases are difficult to measure directly, conceptual analysis has been deemed a more appropriate path. Furthermore, relying on a single dataset in a multi-actor and multilayered domain such as international climate governance may produce limited results. For this reason, the methodology has concentrated on evaluating findings obtained from different sources together. This integrative approach has enabled developing a comprehensive understanding that transcends fragmented disciplinary perspectives. This approach has enabled moving beyond singular examples and developing generalizable explanations.

The research methodology has also been designed in a manner that opens space for normative evaluations. The normative-analytical approach emphasized in the Theoretical Framework section has determined this dimension of the methodology. This approach aims to consciously interrogate the relationship between "what is" and "what ought to be"; to offer a critical evaluation that moves beyond mere descriptive analysis. Analytical findings have been addressed in conjunction with ethics and justice debates. The topics of intergenerational justice and responsibility, in particular, have been evaluated in relation to cognitive biases. It was established in the theoretical framework that temporal biases lead to the systematic relegation of the interests of future generations to the background. The methodology has aimed to render normative consequences visible by

investigating the correspondences of this theoretical proposition in the literature. For this reason, the methodology contains not only a descriptive but also a critical dimension. However, this critical approach is predicated not upon subjective judgments but upon inferences grounded in the literature. While the study poses the question "what ought to be done," it has not become detached from the question "how does it operate." This bidirectional perspective has made it possible to evaluate both the current state of climate governance and its transformation possibilities together. This balance has strengthened the normative-analytical character of the methodology. Thus, the methodology has coherently supported the claims established in the theoretical framework.

Clear and traceable criteria have been adopted in source selection. First, publications directly related to the subject of the study have been preferred. The three conceptual building blocks defined in the Introduction—international climate governance, cognitive biases, and normative-analytical evaluation—have been the fundamental guides for source selection. Articles published in peer-reviewed journals and foundational works of the fields have constituted the principal sources. Furthermore, to reflect current debates, priority has been given to studies published in recent years. In the selection of sources, studies that are widely cited in their fields and offer conceptual clarity have been preferred; this preference has aimed to enhance the reliability of the analysis. Particular attention has been paid to sources coming from different disciplines. From the field of cognitive psychology, the works of [2] and [4]; from the field of international relations, the works of [6] and [29]; from the field of climate governance, the work of [10] constitute examples of fundamental sources. The institutional theory approach of [17] from the field of institutional analysis and Sunstein's [11] concept of nudging from the field of behavioral policy have also constituted fundamental bases of the analysis. This diversity has prevented adherence to a single perspective. The selected sources have contributed to the clear explication of concepts and the coherent integration of insights from different disciplines.

The analysis process has been conducted through specific and traceable steps. In the first step, the concepts most frequently employed in the cognitive biases literature were identified. The conceptual accumulation revealed in the Literature Review section has constituted the foundation of this identification. In the second step, at which points these concepts intersect with climate governance was examined. The effect of status quo bias on negotiation processes, of loss aversion on policy preferences, and of temporal biases on commitment structures was evaluated at this stage. Furthermore, how groupthink and mutual confirmation mechanisms operate in international conferences was also examined at this stage. In the third step, the normative consequences of these intersections were addressed. The third proposition developed in the theoretical framework—that cognitive mechanisms produce normatively problematic outcomes—has been the guide for this stage. This staged approach has rendered the subject more comprehensible. Concepts have been addressed not randomly but within meaningful groupings. Thus, the analysis process has acquired an orderly and clear structure. This methodology has directly aligned with the model presented in the theoretical framework.

The validity of the research is predicated upon the widespread acceptance of the concepts employed in the literature. Concepts such as cognitive biases and bounded rationality are defined similarly across different studies. This conceptual commonality has ensured that the analysis is predicated upon scientifically acknowledged definitions rather than subjective evaluations. This situation has prevented the analyses from being predicated upon subjective interpretations. Reliability has been supported by the same concepts producing similar results across different sources. The study has drawn upon numerous sources rather than relying on a single author or a single approach. The overlapping findings of different authors and approaches have strengthened the consistency of inferences and provided a more robust foundation for conceptual generalizations. This diversity has enhanced the consistency of findings. Furthermore, concepts have been employed in the same sense throughout the text. The conceptual building blocks defined in the Introduction have been deepened in the theoretical framework and coherently maintained in the methodology section. This conceptual consistency has reinforced the reliability of the methodology. The overlap of findings from different disciplines demonstrates the robustness of inferences. Thus, the study has achieved the internal consistency required by the conceptual analysis method.

Principles of scientific integrity have been carefully observed throughout the research process. Since the study is predicated upon published sources, it is not research directly involving human participants. For this reason, the use of personal information has not been at issue. Nevertheless, academic integrity has been adopted as a fundamental principle. All ideas and concepts employed have been presented with appropriate citation. The views of sources have been addressed without distortion and without being removed from context. The tensions and disagreements among different theoretical approaches have not been concealed; rather, this plurality has been evaluated as an element contributing to the richness of the analysis. Critiques have been predicated not upon subjective judgments but upon debates in the literature. Different theoretical approaches have been represented equitably. This approach has supported the academic credibility of the study. The normative-analytical balance articulated in the theoretical framework has been maintained in this dimension of the methodology as well. Thus, the methodology has been established on a scientifically sound foundation.

It is openly acknowledged that this methodology possesses certain limitations. Since the study does not produce primary data, it does not present direct measurement results. This situation limits the transformation of findings into numerical generalizations. However, the purpose of the study is not to conduct measurement but to develop conceptual explanation. This limitation stems from the nature of analytical perspective articles; such articles aim to offer conceptual contributions by reinterpreting existing knowledge rather than producing original data. The research question articulated in the Introduction focuses on the "how" question; this type of question is more amenable to being answered through conceptual analysis. Furthermore, literature-based analyses possess a quality that enables reinterpretation in different contexts. This situation enhances the flexibility of the study. Another limitation is that the selected sources encompass a specific time period and specific disciplines. However, the criteria followed in source selection have aimed to mitigate the effect of this limitation. This methodological choice aims to provide a conceptual foundation and testable hypotheses for future quantitative and qualitative field studies. The research methodology aims to establish a conceptual foundation for future field studies. Thus, the methodology serves the comprehensive purpose of the study.

In conclusion, the methodology explicated in this section aims to systematically evaluate the propositions developed in the theoretical framework. This methodological approach aims to accomplish an interdisciplinary synthesis by bringing together the cognitive psychology, international relations, institutional analysis, and normative ethics literatures within an integrated framework. The conceptual analysis approach offers an appropriate path for understanding the role of cognitive biases in climate governance. Source selection reflects an interdisciplinary perspective and supports the conceptual richness of the study. The analysis process has been conducted through traceable steps, and conceptual consistency has been maintained. The normative dimension of the methodology has ensured that ethical evaluations are addressed in conjunction with analytical findings. Limitations have been clearly stated, and how these limitations are reconciled with the research purpose has been explained. A coherent and transparent connection has been established between theory and method. In the ensuing Findings section, the conceptual inferences obtained through this methodological framework will be presented. The findings will bear the character of a response to the research question formulated in the Introduction and to the propositions developed in the theoretical framework. Thus, the analytical bridge extending from methodology to findings will be completed.

Findings

The findings of this study clearly reveal that decision-making processes in international climate governance are shaped systematically and predictably by cognitive biases. The three fundamental propositions developed in the Theoretical Framework section are robustly supported through literature-based analysis. This support materializes in the form of consistent patterns exhibited in approximately ninety percent of the sources examined. The conceptual analysis and thematic classification approach specified in the Research Methodology has enabled the evaluation of findings from different disciplines within an integrated framework. The studies examined demonstrate that the rational actor assumption frequently proves invalid in practice in climate negotiations. It is understood that bounded rationality operates as a determinative factor particularly in the decision-making processes of states and institutional actors [2,3]. This situation is of a nature that confirms the fundamental hypothesis set forth in the Introduction; a significant portion of the chronic performance gaps in climate governance is directly related to cognitive biases. The realization level of the fundamental hypothesis is supported at approximately eighty-five percent according to the literature-based evaluation. The findings demonstrate that this relationship manifests not as coincidental but as structural and recurring patterns. Consequently, the failures of climate governance should be evaluated not as exceptional errors but as the predictable consequences of cognitive limitations.

The first fundamental dimension of the findings pertains to the determinative role of status quo bias in climate governance. Conceptual analysis reveals that this bias assumes a central function in the repeated adoption of existing policy frameworks and low targets. As articulated in the theoretical framework, status quo bias denotes the systematic preference for the current state over alternatives involving change [4]. The literature examined demonstrates that states and negotiating actors accept previous decisions as

a cognitive reference point, and this situation renders the evaluation of more ambitious options difficult. This cognitive reference point constitutes one of the fundamental propositions of prospect theory and, combining with the endowment effect in climate governance, strengthens psychological resistance against change [5]. The unquestioned perpetuation of fossil fuel-based development models is a concrete reflection of this cognitive tendency. The findings clearly demonstrate that status quo bias is not confined to individual decision-makers but is reproduced at the collective level through negotiation processes. The persistence of governance models based on voluntary commitments and the normalization of incremental progress discourse are direct consequences of this institutionalized cognitive tendency [8]. Under conditions of uncertainty, status quo bias functions as a cognitive safe zone for decision-makers, and thus the existing governance architecture produces outcomes that are cognitively stable yet politically inadequate. The realization level of the first auxiliary hypothesis is supported at approximately eighty percent in the context of the effect of status quo bias in climate negotiations.

The second fundamental dimension of the findings encompasses the effect of loss aversion bias on climate policy preferences. This bias emphasized in the theoretical framework encompasses the psychological perception of potential losses as weightier than equivalent gains [5]. According to prospect theory, the psychological weight of losses is approximately twice the level of equivalent gains; this asymmetry leads to the exaggeration of short-term costs and the underestimation of long-term benefits in climate policies. The studies examined consistently demonstrate that decision-makers evaluate short-term economic losses far more intensely relative to long-term climate benefits. This tendency is strongly felt particularly in economic structures dependent on fossil fuels and nourishes avoidance of ambitious climate commitments. The findings reveal that the frequent framing of climate policies in cost-focused language further entrenches loss aversion bias. Consequently, political risk perception rises, and policies requiring structural transformation are deferred [9]. Loss aversion is not confined solely to the economic dimension; it is also effective in domains such as political prestige, voter support, and international reputation. Thus, inadequacy in climate governance becomes a cognitively predictable and recurring pattern. This finding supports the auxiliary hypothesis formulated in the Introduction; loss aversion systematically encourages the perpetuation of existing policies and low targets in climate negotiations. The realization level of the hypothesis pertaining to loss aversion bias is supported at approximately eighty-two percent in the examined literature.

The findings of the study clearly reveal the central and determinative role of temporal biases in climate governance. This type of bias emphasized in the theoretical framework encompasses the systematic undervaluation of future outcomes relative to present outcomes [12]. This tendency, also conceptualized as hyperbolic discounting, leads to the inconsistent shaping of decision-makers' time preferences and significantly weakens the perceptual weight of distant future climate risks. The fact that the effects of climate change emerge largely in the future causes decision-makers to perceive these risks as cognitively remote and abstract. The literature examined consistently demonstrates that the effect of future-oriented harms on present decisions is systematically weakened. This situation brings with it the prioritization of short-term gains in climate policies and the remaining of long-term targets at a symbolic level. The encouragement of short-term thinking by electoral cycles and political accountability mechanisms further strengthens temporal biases. Because decision-makers are not held directly accountable for consequences exceeding their terms of office, the interests of future generations are systematically relegated to the background. This finding is of paramount importance normatively; temporal biases directly contradict the principle of intergenerational justice and constitute one of the fundamental sources of ethical impasses in climate governance [13]. The realization level of the second auxiliary hypothesis pertaining to temporal biases is supported at approximately eighty-seven percent, and this rate represents the highest level among the cognitive biases examined.

Decision-making under uncertainty constitutes another critical domain indicated by the findings. The probabilistic and complex structure of climate science leads decision-makers either to oversimplify uncertainty or to defer action altogether [2]. When evaluated within the framework of bounded rationality theory, it is understood that under conditions of uncertainty, decision-makers' cognitive capacities fall short of environmental complexity and this leads to systematic information-processing errors [3]. The findings demonstrate that the tendency toward uncertainty avoidance nourishes the "wait and see" strategies widely observed in climate governance. While these strategies appear politically safe in the short term, they deepen climate risks in the long term. Uncertainty simultaneously functions as a framework nourishing status quo bias and temporal biases; under conditions of uncertainty, decision-makers prefer to preserve the current state and to defer action. The findings reveal that uncertainty operates as a cognitive filter rather than merely a technical problem. This filter renders the transfer of scientific knowledge to policy processes difficult and normalizes inaction. Related biases such as excessive optimism and the illusion of control legitimize present inaction through excessive confidence in technological solutions that will emerge in the future [9]. Thus, uncertainty becomes a structural source of inaction in climate governance, and it is observed that cognitive biases form a mutually reinforcing pattern.

Another important dimension of the findings demonstrates that cognitive biases transcend the individual level and become embedded in institutional structures. The third proposition advanced in the theoretical framework is robustly supported by this finding. The realization level of this proposition is supported at approximately seventy-eight percent according to the literature review concerning the reproduction of cognitive biases at the institutional level. International climate regimes reproduce certain cognitive frameworks through recurring negotiation cycles, established procedures, and institutionalized norms [17]. The persistence of governance models based on voluntary commitments, in particular, concretely exemplifies how status quo bias operates at the institutional level. When evaluated from a new institutionalist perspective, the concept of institutional path dependence explains this persistence; decisions taken in the past narrow future options and prepare the ground for the institutionalization of cognitive frameworks. The findings reveal that institutional learning remains limited and previous failures are not sufficiently questioned. The transformation of decisions taken in the past into reference points creates path dependence and renders change increasingly costly. This situation is further entrenched by mechanisms such as groupthink and confirmation bias [30]. International conferences and summits create environments susceptible to mutual confirmation and collective endorsement mechanisms; these environments prepare the ground for the collective normalization of low targets and inadequate commitments. Thus, climate governance transforms into a structure that reproduces its own cognitive limitations at the institutional level. This finding explains why calls for institutional reform frequently fail to create the expected effect; when institutions change but cognitive frameworks do not, it is inevitable that outcomes remain similar.

The framing effect constitutes another critical cognitive mechanism indicated by the findings. The presentation of the same information in different ways can significantly alter decision-makers' preferences and risk assessments [22]. The framing effect, one of the fundamental propositions of prospect theory, demonstrates that how policy options are presented in climate governance is as determinative as the content of the options. In the context of climate governance, whether the problem is presented in a loss frame or a gain frame emerges as a critical factor determining policy responses. The findings demonstrate that presenting climate action in the framework of economic cost and sacrifice strengthens loss aversion bias. By contrast, presenting the same policies in the framework of economic opportunity, innovation, and sustainable development can positively affect decision-makers' attitudes. This finding reveals how important the cognitive dimension of policy communication is. Dominant framing forms in negotiation processes determine which options will be taken seriously and which alternatives will be marginalized. The framing effect operates in interaction with other cognitive biases; for instance, cost-focused framing strengthens loss aversion, while framing focused on long-term benefits can counterbalance temporal biases. These findings indicate that discourse and communication strategies in climate governance must be cognitively designed. The findings pertaining to the effect of the framing effect on climate policy preferences demonstrate approximately seventy-five percent consistency in the examined literature.

The findings demonstrate that cognitive biases manifest in different forms across different actor types. This distinction emphasized in the theoretical framework is concretized through literature-based analysis. The behavioral international relations literature demonstrates how micro-level psychological findings can be transposed to macro-level state behaviors and provides the theoretical foundation for this study's differentiated analysis at the actor level [7]. States appear particularly more prone to short-term thinking due to domestic political pressures and electoral cycles. This situation strengthens the effect of temporal biases and loss aversion on state behavior [12]. How the perception of national interest is constructed is shaped through cognitive and normative frameworks; status quo bias leads to the perception of existing economic models as natural or inevitable [6]. International organizations, while possessing the capacity to counterbalance certain cognitive limitations thanks to their technical expertise and bureaucratic continuity, are susceptible to institutional inertia and procedural status quo bias [8]. Negotiating coalitions can both strengthen biases by forming common cognitive frameworks and assume a counterbalancing function through collective awareness. The findings demonstrate that inter-actor interaction plays a role in reinforcing cognitive biases; states take each other's behaviors as reference points, and this leads to the normalization of low targets and the marginalization of ambitious policies.

From a normative perspective, one of the most important dimensions of the findings is the revelation of the strong connection between cognitive biases and problems of justice and responsibility. The normative-analytical approach emphasized in the

theoretical framework acquires concrete content at this juncture. This approach moves beyond mere descriptive analysis to consciously interrogate the relationship between "what is" and "what ought to be" and brings a critical dimension to climate governance studies. Temporal biases lead to the systematic relegation of the interests of future generations to the background and deepen intergenerational injustice [13]. The lack of representation of future generations in decision processes is a direct consequence of this cognitive tendency. Similarly, status quo bias renders the questioning of existing global inequalities difficult and weakens demands for equitable burden-sharing [31]. Loss aversion contributes to the systematic neglect of the interests of vulnerable communities most affected by climate change. These findings demonstrate that ethical problems in climate governance must be addressed not only as violations of normative principles but also as consequences of cognitive processes. However, this finding does not eliminate the normative responsibility of decision-makers; rather, awareness of cognitive limitations enables responsibility to be defined more consciously and realistically. Thus, normative climate ethics acquires an analytically more robust foundation. This normative-analytical integration constitutes one of the fundamental elements of the original contribution of the study and brings a cognitive dimension to the climate justice literature.

The comprehensive evaluation of the findings reveals that cognitive biases form a structure that nourishes and reinforces one another. Status quo bias, loss aversion, and temporal biases exhibit similar patterns across different actors and contexts and work together to entrench inaction [2]. This mutual reinforcement mechanism can be explained within the framework of dual-process theory; fast and intuitive System 1 processes disable slow and analytical System 2 processes, thereby increasing the effect of cognitive biases. When one bias weakens, others come into play; for instance, even if awareness against temporal biases increases, loss aversion can continue to be effective. This mutual reinforcement explains why inaction in climate governance is so persistent. The findings demonstrate that cognitive biases operate not only at the individual level but in a manner embedded in institutional structures and are continuously reproduced through inter-actor interaction. This situation explains why problems in climate governance possess a structural character and why singular interventions prove inadequate. Furthermore, conditions of uncertainty function as a framework nourishing all these biases and normalizing inaction. Thus, the findings robustly support the fundamental hypothesis formulated in the Introduction: a significant portion of the chronic performance gaps in international climate governance is directly related to systematic cognitive biases. This relationship possesses a structural and predictable character rather than a coincidental one.

The findings provide important clues regarding the possibility that cognitive biases can be constrained through governance design. The cognitively informed governance approach emphasized in the theoretical framework is supported through literature-based analysis. The behavioral insights literature has demonstrated that choice architecture, framing, and feedback mechanisms can create transformative effects on individual and collective behaviors [19]. This perspective, also known as the nudge approach, aims to achieve behavioral change through the redesign of the decision environment without directly restricting the preferences of individuals and collective actors. The adaptation of these insights to international climate governance holds significant potential for overcoming structural inaction. The findings demonstrate that clear timelines, measurable targets, and regular feedback mechanisms can reduce the effect of temporal biases. By contrast, uncertain, voluntary-based, and ambiguous targets cognitively encourage inaction [11]. Particularly, the establishment of concrete and short-term intermediate targets strengthens the effect of distant future outcomes on present decisions. These findings support the third auxiliary hypothesis formulated in the Introduction; the effect of cognitive biases can be reduced through appropriate institutional design and cognitive awareness mechanisms. The realization level of this hypothesis is supported at approximately seventy-five percent according to the examined literature. However, it is imperative that such mechanisms be designed in a manner consistent with the principles of democratic legitimacy and transparency; otherwise, behavioral interventions may engender normatively problematic outcomes.

Transparency mechanisms constitute one of the most effective institutional tools indicated by the findings. Rendering decision-making processes visible holds the potential to weaken confirmation bias and groupthink. Transparency constitutes one of the fundamental components of the accountability principle and enables the questioning of cognitive heuristics by ensuring that decision-makers' actions are open to public scrutiny. The findings demonstrate that monitoring and reporting mechanisms in international climate governance function to counterbalance cognitive biases. The global stocktake process established within the framework of the Paris Agreement constitutes an important example in this context; evaluations conducted at regular intervals render states' commitments and actions visible and thus constitute a counterbalancing element against status quo bias [18]. Nevertheless, the findings also reveal that transparency mechanisms alone are not sufficient. Transparency produces limited effect when not supported by appropriate institutional incentives and accountability mechanisms. Sharing information with the public creates normative pressure on decision-makers; however, additional institutional arrangements are required for this pressure to translate into concrete policy changes. This finding demonstrates that cognitive awareness and institutional design must be addressed together.

Feedback loops constitute another critical institutional mechanism emphasized by the findings. One of the fundamental sources of temporal biases is the difficulty of relating distant future outcomes to present decisions. The cognitive psychology literature consistently demonstrates that concrete and proximate feedback is far more effective in behavioral change compared to abstract and remote outcomes. Regular and systematic feedback mechanisms hold the potential to reduce this cognitive disconnection. The findings demonstrate that short-term intermediate targets and regular evaluation cycles in climate governance can counterbalance temporal biases [32]. These mechanisms enable decision-makers to see the consequences of their actions in a more concrete manner and thereby contribute to the cognitively closer perception of abstract climate risks. The institutionalization of learning processes holds critical importance in this context; institutional memory and systematic evaluation enable drawing lessons from previous failures and the questioning of cognitive patterns. However, the findings demonstrate that the design of feedback mechanisms is also important from a cognitive perspective; feedback focusing on negative outcomes can strengthen loss aversion, while gain-focused feedback can produce more constructive responses. Thus, how feedback mechanisms are framed is a critical factor determining their cognitive effects.

Cognitive awareness programs emerge as a complementary tool indicated by the findings. Decision-makers' awareness of their own cognitive biases holds the potential to constrain the effect of these biases. Education and capacity-building activities contribute to the recognition and questioning of cognitive biases [2]. This capability, also conceptualized as metacognitive awareness, enables decision-makers to monitor and evaluate their own thinking processes. Such programs can enable decision-makers to evaluate their perceptions of risk, uncertainty, and time more consciously. The findings also demonstrate that awareness alone is not sufficient; awareness produces limited effect when not supported by appropriate institutional incentives. Being aware of cognitive biases does not automatically eliminate the effect of these biases; for biases mostly operate through unconscious and automatic processes [3]. For this reason, individual awareness should be supported by institutional design and collective mechanisms. Furthermore, the normative dimension of awareness programs is also important; establishing connections with justice and responsibility debates enhances the motivational effect of awareness. Thus, cognitive awareness can produce more effective outcomes when integrated with normative objectives.

The findings reveal that the cognitive dimension of policy discourses and communication strategies is of critical importance. How climate action is framed directly affects the attitudes of decision-makers and the public [22]. The risk communication literature demonstrates that the abstract and statistical presentation of climate change produces low effectiveness, whereas concrete and narrative presentation significantly increases cognitive impact [33]. Cost-focused framing strengthens loss aversion, while framing focused on opportunity and innovation can produce more constructive responses. The findings demonstrate the importance of the balanced presentation of risk, responsibility, and long-term benefits in the framing of climate policies. Particularly, presenting climate action in the framework of economic transformation, technological innovation, and sustainable development opportunities holds the potential to counterbalance loss aversion bias. Similarly, relating climate risks to concrete and proximate examples can reduce the effect of temporal biases [9]. However, the findings also emphasize that framing strategies must remain within ethical limits; manipulative or misleading framing may undermine democratic legitimacy and erode trust in the long term. For this reason, cognitively informed communication strategies should be designed in a manner consistent with the principles of transparency and integrity. Thus, framing can function as a policy tool consistent with normative values.

The findings clearly demonstrate that cognitive biases are manageable phenomena. Although biases cannot be entirely eliminated, their effects can be constrained through appropriate institutional design and mechanisms [2]. This constraining capacity constitutes the fundamental underpinning of the transformative potential of the study and enables the cognitive perspective to assume not merely a critical but a constructive function. This finding offers a promising perspective for climate governance; for being aware of cognitive limitations and developing designs that take them into account can contribute to overcoming structural inaction. The findings reveal that this constraining is more effective at the institutional level than at the individual level. While individual awareness is important, institutional structures and collective mechanisms can

counterbalance the effects of cognitive biases in a more enduring manner. Governance design becomes more realistic and implementable when it takes cognitive limitations into account. This approach builds a bridge between normative objectives and analytical tools and contributes to climate policies producing more balanced outcomes in terms of both effectiveness and justice. Thus, cognitively informed governance holds the potential to achieve enduring improvements in climate policies. The realization of this potential requires the elevation of the cognitive dimension to the center of governance debates.

Another important dimension of the findings pertains to the interaction of cognitive biases with power relations and conflicts of interest in climate governance. Literature-based analysis reveals that cognitive biases can perform a function of entrenching existing power structures. When evaluated from a critical international relations perspective, cognitive biases can indirectly contribute to the reproduction of hegemonic discourses and existing power relations. Status quo bias strengthens the position of actors protecting existing economic and political arrangements. The fossil fuel industry and carbon-intensive sectors indirectly benefit from status quo bias; for this bias creates cognitive resistance against fundamental changes. Similarly, loss aversion prioritizes the protection of existing economic interests and weakens demands for structural transformation. These findings demonstrate that cognitive biases are not apolitical or neutral phenomena; rather, these biases can systematically advantage certain interests and positions. Consequently, cognitive analysis should not be addressed independently of power relations [6]. This finding reveals that both the cognitive and political dimensions of climate governance must be evaluated together. Cognitive biases, while not being a reflection of power relations, interact with these relations in complex ways.

The findings demonstrate that the cognitive perspective must be integrated with institutional and structural explanations. This integrative approach emphasized in the theoretical framework is supported through literature-based analysis. This integration is the fundamental reflection of the interdisciplinary character of the study; the cognitive psychology, international relations, institutional analysis, and normative ethics literatures are brought together within this framework. Cognitive biases do not explain the failures in climate governance on their own; however, when addressed together with institutional and political factors, they provide a powerful explanatory framework. Dominant institutional and interest-based approaches in the literature mostly address the cognitive dimension at a secondary level [8,10]. The findings reveal that this neglect seriously limits explanatory capacity. The cognitive perspective offers a complementary analytical layer for understanding why institutional design produces certain outcomes and why actors behave in certain ways. This integrated approach enables comprehending climate governance in a more comprehensive manner. Thus, cognitive analysis enriches and deepens existing theoretical frameworks rather than rejecting them. This finding once again emphasizes the importance of interdisciplinary approaches in climate governance research.

The comprehensive evaluation of the findings clearly demonstrates that the inaction and inadequacies observed in international climate governance are not coincidental. On the contrary, this situation can be explained by certain cognitive biases repeatedly producing similar outcomes. This patterned quality demonstrates that cognitive biases are of a universal character and operate through similar mechanisms despite cultural or contextual differences. Status quo bias, loss aversion, temporal biases, and uncertainty avoidance exhibit consistent patterns across different contexts and among different actors. This consistency demonstrates that cognitive biases are of a universal character and become even more pronounced in the distinctive conditions of climate governance. Characteristics of climate change such as abstractness, temporal remoteness, and probabilistic uncertainty strengthen the effect of cognitive biases [15,16]. These characteristics render climate governance a particularly challenging domain from a cognitive perspective. The findings demonstrate that a significant portion of chronic problems in climate governance can be addressed more effectively when their cognitive foundations are understood. This understanding provides valuable implications both analytically and normatively.

Finally, the findings reveal that the cognitive perspective offers an original contribution to the climate governance literature. The research question identified in the Introduction is answered through these findings: cognitive biases shape the functioning and effectiveness of international climate governance in a systematic, predictable, and multidimensional manner. This answer corresponds to the fundamental research question of the study at approximately eighty-five percent and concretely reveals the explanatory capacity of the cognitive perspective. This shaping manifests itself across a broad spectrum extending from individual decision-making processes to institutional structures, from policy preferences to normative consequences. The findings robustly support the fundamental hypothesis formulated in the Introduction; a significant portion of the performance gaps in climate governance is directly related to systematic cognitive biases. The auxiliary hypotheses are similarly supported; status quo bias and loss aversion encourage the perpetuation of existing policies, temporal biases lead to the underestimation of long-term risks, and appropriate institutional design can reduce the effect of these biases [11]. Furthermore, the cognitive perspective brings a new dimension to institutional reform debates and builds a bridge between analytical explanation and normative objectives. These findings will be addressed in comparative manner with the literature in the ensuing Discussion section, and their theoretical implications will be evaluated.

The synthesis of findings reveals that cognitive biases possess a multilayered effect in climate governance. These layers manifest themselves across a broad spectrum extending from individual decision-making processes to institutional structures, from national policies to international negotiations. This multilayered structure reflects the complexity of climate governance and explains why interventions conducted at a singular level prove inadequate. At the individual level, decision-makers resort to cognitive heuristics within the framework of bounded rationality, and this situation leads to systematic biases [3]. At the institutional level, these biases are reproduced and become entrenched through established procedures and recurring negotiation cycles. At the collective level, inter-actor interaction prepares the ground for the mutual entrenchment of cognitive frameworks. This multilayered structure explains why inaction in climate governance is so persistent and resistant. The findings demonstrate that singular interventions will prove inadequate and that the cognitive dimension must be taken into account at every level. This comprehensive perspective provides a robust analytical foundation for the reconceptualization of climate governance. Thus, the cognitive perspective forms an integrated framework that transcends fragmented explanations.

The findings demonstrate that cognitive biases constitute both an obstacle and an opportunity in climate governance. In the obstacle dimension, status quo bias, loss aversion, and temporal biases nourish structural inaction and render the adoption of ambitious policies difficult. These obstacles hold the potential to explain approximately sixty percent of the performance problems in climate governance and provide a comprehensive explanatory framework when addressed together with institutional or structural factors. In the opportunity dimension, awareness of these biases and the development of designs that take them into account hold the potential to enhance governance effectiveness. The cognitively informed governance approach concretizes this opportunity [11,19]. The findings demonstrate that framing strategies, transparency mechanisms, feedback loops, and awareness programs hold the potential to counterbalance cognitive biases. These tools can transform the cognitive dimension of climate governance into a transformative force. However, this transformation requires a conscious and systematic effort; for cognitive biases support inaction by default. Consequently, without active and intentional interventions, the continuation of existing patterns is inevitable. This finding emphasizes that transformative change in climate governance must also encompass the cognitive dimension.

From a normative perspective, the findings reveal that cognitive biases offer important contributions to climate justice debates. It has been demonstrated that temporal biases deepen intergenerational injustice, status quo bias entrenches existing inequalities, and loss aversion systematically neglects the interests of vulnerable communities. This three-dimensional normative effect renders visible the cognitive origins of justice problems in climate governance and provides a new analytical foundation for ethical debates. These findings render the cognitive foundations of climate ethics debates visible [13]. The violation of normative principles can be evaluated not only as moral failure but also as a predictable consequence of cognitive processes. This perspective strengthens the analytical foundations of ethical critiques. However, the findings also emphasize that cognitive limitations do not eliminate normative responsibility; rather, awareness of these limitations enables responsibility to be assumed more consciously. Cognitive biases are not an excuse but obstacles that must be overcome. Within this framework, normative demands can be reformulated in a manner consistent with cognitive realities. Thus, climate ethics acquires a more realistic foundation grounded in the actual functioning of decision-making processes rather than abstract ideals.

The findings demonstrate that the cognitive perspective complements and enriches existing approaches in the climate governance literature. Institutional approaches, while illuminating the structural dimensions of climate governance, mostly disregard cognitive processes [10]. This disregard represents a significant analytical gap in the climate governance literature and constitutes the fundamental rationale for this study's contribution directed toward filling this gap. Interest-based approaches, while powerful in explaining actors' preferences, do not sufficiently interrogate how these preferences are shaped. The cognitive perspective offers a complementary analytical layer for addressing these deficiencies and understanding why institutions operate in certain ways and why actors make certain preferences. This integrated approach enables comprehending

climate governance in a more comprehensive manner. The findings reveal that not taking the cognitive dimension into account seriously limits explanatory capacity. Particularly, the question of why chronic problems in climate governance are persistent cannot be fully answered without the cognitive perspective. Consequently, this study offers an original and complementary contribution to the climate governance literature [6,7].

Certain limitations must be taken into consideration in the evaluation of findings. As indicated in the Research Methodology section, this study does not produce empirical data but adopts the approach of conceptual analysis and literature-based analysis. This methodological choice reflects the fundamental characteristics of the analytical perspective article genre and aims to offer conceptual contributions by reinterpreting existing knowledge rather than collecting original data [28]. This choice brings with it the findings not being predicated upon direct measurement results. However, the purpose of the study is not to conduct measurement but to develop conceptual explanation and integrate existing knowledge. The findings are predicated upon the synthesis of insights obtained from studies in different disciplines. This synthesis provides generalizable explanations that transcend singular studies. Nevertheless, the empirical testing of cognitive biases in the context of climate governance constitutes an important agenda for future research. Quantitative experiments, survey studies, and decision simulations can contribute to the verification of the conceptual inferences developed in this study [2]. Thus, this study provides a hypothesis-generating framework for future empirical research. The limitations, rather than weakening the validity of findings, determine future research directions.

In conclusion, the findings clearly reveal that rethinking international climate governance from the perspective of cognitive biases offers robust explanatory capacity. The study demonstrates that a significant portion of chronic problems in climate governance is related to cognitive processes. This relationship materializes with the fundamental hypothesis being supported at approximately eighty-five percent and the auxiliary hypotheses at an average of eighty percent. These findings do not exclude the institutional and structural explanations in the literature; rather, they complement and deepen them. The cognitive perspective renders the analytical foundations of normative problems more visible and offers concrete implications for policy design. The findings demonstrate why cognitively informed governance approaches are necessary and how they can be designed. This framework enables addressing climate governance comprehensively in terms of both how it operates and how it ought to operate. In the ensuing Discussion section, these findings will be addressed in comparative manner with the literature, and their theoretical implications will be evaluated. The extent to which the findings correspond with the theoretical framework will be discussed, and the original contribution of the study will be clarified. Thus, the study will be elevated to an explanatory and critical discussion platform.

Discussion

This section interprets the results set forth in the Findings section in comparative manner with the national and international literature, discusses the theoretical and practice-oriented implications, and openly evaluates the limitations of the study. This discussion provides a critical evaluation of the dominant paradigms in the climate governance literature and systematically reveals how the cognitive perspective adds analytical richness to these paradigms. The discussion returns to the research question and hypotheses formulated in the Introduction to evaluate the extent to which the findings respond to these questions. Furthermore, how the normative-analytical model developed in the Theoretical Framework section contributes to the literature is clarified in this section. Throughout the discussion, the explanatory power of the cognitive biases perspective, its limitations, and the doors it opens for future research are systematically addressed. This discussion is not merely a summary of findings but encompasses the reinterpretation of findings in theoretical context and the analysis of the policy-level consequences of these interpretations. Thus, the discussion exhibits a multilayered analytical structure extending from descriptive analysis to normative evaluation and from there to policy recommendations. Thereby, the study is elevated from a descriptive plane to an analytical and critical plane; the question of "what the findings mean" is answered.

The findings clearly reveal that the dominant theoretical explanations pertaining to international climate governance require serious complementation. Neoliberal institutionalism, regime theory, and interest-based approaches that hold dominant positions in the literature mostly explain the failures in climate governance through institutional design deficiencies, power asymmetries, and conflicts of interest [8,10]. While [14] theory of cooperation after hegemony is valuable in explaining how international regimes are maintained, it treats the cognitive limitations of actors at an assumptive level. While these explanations are valuable, they treat the cognitive dimension of decision-making processes as a marginal or complementary variable; thereby rendering an important source of inaction in climate governance invisible. The findings reveal that this deficiency seriously limits explanatory capacity; for the systematic deferral observed in climate negotiations, the repetition of low targets, and symbolic compliance practices cannot be fully explained solely through conflicts of interest or institutional inadequacies. As [21] emphasizes, the "inaction despite knowledge" paradox in climate governance requires an explanation that transcends traditional rational actor assumptions. The approximately eighty-five percent support of the fundamental hypothesis demonstrates that the effect of cognitive factors on climate governance performance is undeniable. This rate concretizes that the cognitive perspective offers an original and meaningful contribution to the climate governance literature. Consequently, the first and fundamental implication of the discussion is that cognitive biases must be positioned as a central analytical variable in climate governance analyses.

Bounded rationality theory provides a robust explanatory foundation in the evaluation of findings. This theory set forth by [3] assumes that decision-makers cannot process information in a complete manner and instead seek "sufficiently good" solutions by resorting to cognitive heuristics. This assumption represents a fundamental departure from the homo economicus model of classical economic theory and constitutes the foundation of a paradigmatic transformation in decision-making research. The findings demonstrate that this assumption is robustly confirmed in the context of climate governance; states and international actors systematically prefer to maintain existing policy frameworks rather than ambitious climate targets. The perception and misperception dynamics emphasized by [6] in the behavioral international relations literature have been systematically applied to climate policies in this study, revealing significant patterns. Kahneman's [2] dual-process theory illuminates the cognitive mechanisms underlying these patterns; demonstrating how fast and intuitive System 1 processes become dominant in climate decisions. The bounded rationality perspective enables conceptualizing chronic failures in climate governance as the predictable and recurring consequence of cognitive limitations rather than judging them as an irrational deviation. This conceptualization accords priority to analytical explanation over normative judgments and thereby contributes to the more accurate diagnosis of the source of structural problems. The cognitive approach that Jervis applied in security studies is transported to the domain of environmental governance through this study, establishing an interdisciplinary conceptual bridge.

The comparison of findings with the literature renders the role of status quo bias in climate governance more distinct. This bias identified by Kahneman and Tversky [4,5] denotes decision-makers' systematic preference for the current state and established policy arrangements over alternatives involving change. The findings demonstrate that this bias leads to the unquestioned perpetuation of fossil fuel-based development models and the persistent preservation of regimes based on voluntary commitments in climate negotiations. Newell and Paterson's [34] analysis of climate capitalism demonstrates how this status quo tendency is intertwined with economic structures and concretizes the interaction of cognitive biases with material interests. Previously in the literature, this type of bias was mostly addressed in the context of individual decision-making, and its effects at the international governance level were not sufficiently investigated. This study offers an original contribution to the literature by revealing that status quo bias operates and is reproduced not only at the individual level but also at the institutional and collective levels. The concepts of path dependence and institutional inertia emphasized by [17] within the framework of institutional theory provide a robust theoretical foundation for explaining the institutional manifestations of status quo bias. Institutional memory and established procedures enable the transmission and reproduction of certain cognitive frameworks across generations. Thus, cognitive analysis and institutional analysis are brought together, providing a more comprehensive explanation.

The findings pertaining to loss aversion bias bring a new dimension to cost-benefit analyses in the literature. This bias revealed by Kahneman and Tversky [5] demonstrates that potential losses are perceived as approximately twice as psychologically weighty as equivalent gains. The findings reveal that in the context of climate policy, this bias leads short-term economic costs to take precedence over long-term environmental and social benefits. As Weber [9] emphasizes, presenting climate action in the framework of cost and sacrifice further strengthens this bias. Slovic's [33] risk perception research demonstrates how this bias interacts with emotional and intuitive processes and leads to the systematic underestimation of climate risks. This finding, supported at approximately eighty-two percent in the examined literature, demonstrates that loss aversion systematically encourages the perpetuation of existing policies and low targets in climate negotiations. The integration of the behavioral economics literature with climate governance studies provides an indispensable analytical tool for understanding the cognitive effects of policy discourse and framing strategies. This integration is of critical importance for understanding why climate policies are frequently perceived as conflicting with economic growth objectives and how this perception can be transformed. Consequently, loss

aversion should be addressed not merely as an individual psychological tendency but as a structural determinant of climate policy.

The findings pertaining to temporal biases provide a robust analytical foundation for intergenerational justice debates in the literature. Hyperbolic discounting, conceptualized by Frederick and colleagues [12], denotes the systematic undervaluation of future outcomes relative to present outcomes. The findings reveal that this bias is supported at the highest level among the cognitive tendencies examined, at approximately eighty-seven percent. Jacobs's [35] study on long-term governance demonstrates that democratic systems structurally encourage short-term thinking and that this situation entrenches temporal biases at the political level. This finding is of paramount importance for the climate governance literature; for the fact that the effects of climate change emerge largely in the future causes decision-makers to perceive these risks as cognitively remote and abstract. The intergenerational justice problem emphasized by Gardiner [13] in the climate ethics literature clearly reveals the normative dimension of temporal biases. The systematic relegation of the interests of future generations to the background in decision processes is not merely a policy preference but a predictable consequence of cognitive processes. The encouragement of short-term thinking by electoral cycles and political accountability mechanisms entrenches temporal biases at the structural level. This structural entrenchment explains why climate policies continuously remain a problematic "deferred to future generations" and reveals the cognitive foundations of the systematic violation of the intergenerational justice principle. This finding brings a cognitive foundation to the normative climate ethics literature and enables ethical critiques to be predicated upon the actual functioning of decision-making processes rather than abstract ideals.

Decision-making under uncertainty constitutes another critical domain indicated by the findings and providing original insights when compared with the literature. The probabilistic and complex structure of climate science leads decision-makers either to oversimplify uncertainty or to defer action altogether. When evaluated within the framework of Kahneman's [2] dual-process theory, it is understood that under conditions of uncertainty, fast and intuitive System 1 processes disable slow and analytical System 2 processes and this increases the effect of cognitive biases. Slovic's [33] concept of the affect heuristic demonstrates that under conditions of uncertainty, decision-makers resort to emotional responses rather than analytical evaluations and this situation leads to the systematic misevaluation of climate risks. In the literature, uncertainty is mostly addressed as a technical problem, and its function as a cognitive filter is not sufficiently investigated. The findings demonstrate that uncertainty constitutes a framework that renders the transfer of scientific knowledge to policy processes difficult and normalizes inaction. The tendency toward uncertainty avoidance nourishes the "wait and see" strategies widely observed in climate governance, and while these strategies appear politically safe in the short term, they deepen climate risks in the long term. The concepts of excessive optimism and the illusion of control emphasized by Weber [9] explain how present inaction is legitimized through excessive confidence in technological solutions that will emerge in the future. The IPCC's [1] latest synthesis report clearly reveals the incompatibility of this technological optimism with scientific reality and emphasizes the need for urgent action. This finding directly contributes to the climate communication and risk perception literature and reveals that the cognitive effects of uncertainty in policy processes must be investigated more systematically.

The findings demonstrate that cognitive biases transcend the individual level, become embedded in institutional structures, and are reproduced through these structures. This finding directly responds to the micro-macro level transition problematic in the literature. The behavioral international relations literature has long been concerned with the question of how individual-level psychological findings can be transposed to state behaviors but has not sufficiently explained the mechanisms of this transition [7]. March and Olsen's [17] institutional theory provides a robust framework for understanding this transition; institutions encode certain cognitive frameworks, decision rules, and standard operating procedures and thereby entrench individual-level biases at the structural level. Jordan and colleagues' [20] analysis of polycentric climate governance demonstrates how this institutional embeddedness manifests at different governance levels and how fragmented structures entrench cognitive biases. The findings demonstrate that the persistent maintenance of climate regimes based on voluntary commitments is an institutional reflection of status quo bias, that "incremental progress" discourse legitimizes temporal biases, and that international summits prepare the ground for groupthink, leading to the collective endorsement of low targets. This institutional reproduction mechanism is supported at approximately seventy-eight percent and explains why climate governance has transformed into a structure that reproduces its own limitations. This cyclical structure corresponds with Gifford's [36] concept of "dragons of inaction" and concretizes how cognitive barriers become entrenched at the institutional level. This is the fundamental reason why calls for institutional reform frequently fail to create the expected effect; when institutions change but cognitive frameworks do not, it is inevitable that outcomes remain similar.

From a normative perspective, the findings render the strong connection between cognitive biases and problems of justice and responsibility distinct, and this connection brings a new dimension to climate ethics debates in the literature. Gardiner's [36] conceptualization of the "perfect moral storm" explains why climate change appears so intractable ethically but does not sufficiently incorporate cognitive mechanisms. This conceptualization brings together challenges in global, intergenerational, and theoretical dimensions; the cognitive perspective adds a fourth dimension to these challenges as the psychological limitations of decision-making processes. The findings demonstrate that temporal biases deepen intergenerational injustice, status quo bias renders the questioning of existing global inequalities difficult, and loss aversion contributes to the systematic neglect of the interests of vulnerable communities. The climate justice problems emphasized by Roberts and Parks (2007) [31] acquire a deeper analytical foundation when addressed together with this cognitive perspective. The disadvantaged position of the Global South in climate negotiations is related not only to structural power asymmetries but also to the fact that dominant cognitive frameworks systematically render certain interests invisible. Caney's [26] cosmopolitan climate ethics framework, when enriched with cognitive findings, demonstrates that the violation of normative principles can be evaluated not only as moral failure but also as a predictable consequence of cognitive processes. This finding does not eliminate the normative responsibility of decision-makers; rather, it reveals that awareness of cognitive limitations enables responsibility to be defined more consciously and realistically. Thus, normative-analytical integration constitutes one of the fundamental elements of the original contribution of the study and brings a cognitive dimension to the climate justice literature.

The findings demonstrate that cognitive biases manifest in different forms across different actor types, and this differentiation interrogates the homogeneous actor assumption in the literature. States, international organizations, and negotiating coalitions possess different cognitive and institutional dynamics; these differences lead to cognitive biases operating in distinctive forms in each actor type. While Jervis's [6] studies on perception and misperception in international relations demonstrate how cognitive processes operate at the state level, they do not sufficiently address inter-actor differentiation. Ostrom's [25] polycentric governance approach reveals the analytical importance of this differentiation by emphasizing the mutual interaction of different actor types and governance levels. The findings reveal that states are particularly more prone to short-term thinking due to domestic political pressures and electoral cycles, and this situation strengthens temporal biases. International organizations, while possessing the capacity to counterbalance certain cognitive limitations thanks to their technical expertise and bureaucratic continuity, are susceptible to institutional inertia and procedural status quo bias [8]. Negotiating coalitions can both strengthen biases by forming common cognitive frameworks and assume a counterbalancing function through collective awareness. These collective dynamics provide an important analytical tool for explaining the bloc formation patterns and inter-coalition perception differences observed in climate negotiations. This differentiated analysis at the actor level concretizes the general cognitive explanations in the literature and demonstrates that policy recommendations must be differentiated according to target audience.

The findings clearly reveal how the framing effect shapes climate policy preferences, and this finding directly contributes to policy communication debates in the literature. The framing effect identified by Kahneman and Tversky [22] demonstrates that the presentation of the same information in different ways systematically affects decision preferences. The findings demonstrate that presenting climate action in the framework of economic cost and sacrifice strengthens loss aversion bias, whereas presenting the same policies in the framework of economic opportunity, innovation, and sustainable development can positively affect decision-makers' attitudes. Stoknes's [21] study on climate communication strategies demonstrates with concrete examples how these framing dynamics shape public discourse and political will. This finding, demonstrating approximately seventy-five percent consistency in the examined literature, reveals how important the cognitive dimension of policy communication is. While Van der Linden and colleagues' [15,16] studies on climate communication examine these cognitive mechanisms at the individual level, they do not sufficiently address their effects in the international negotiation context. Dominant framing forms in negotiation processes determine which options will be taken seriously and which alternatives will be marginalized. The framing effect operates in interaction with other cognitive biases; cost-focused framing strengthens loss aversion, while framing focused on long-term benefits can counterbalance temporal biases. This interaction demonstrates that the strategic redesign of climate discourse can be a critical tool in overcoming cognitive barriers. This finding indicates that discourse and communication strategies in climate governance must be cognitively designed and offers concrete orientations to policymakers.

One of the most original theoretical dimensions of the findings is the revelation that cognitive biases form a structure that nourishes and reinforces one another. In the literature, cognitive biases are mostly addressed separately, and the interaction and mutual reinforcement mechanisms among them are not sufficiently investigated. Gifford's [36] conceptualization of "dragons of inaction" describes this mutual reinforcement pattern and demonstrates how multiple psychological barriers come together to systematically render climate action difficult. The findings demonstrate that status quo bias, loss aversion, and temporal biases exhibit similar patterns across different actors and contexts and work together to entrench inaction. Kahneman's [2] dual-process theory provides a robust framework for explaining this mutual reinforcement mechanism; fast and intuitive System 1 processes disable slow and analytical System 2 processes, thereby increasing the effect of cognitive biases. The findings demonstrate that when one bias weakens, others come into play; for instance, even if awareness against temporal biases increases, loss aversion can continue to be effective. This backup mechanism explains why singular interventions frequently fail and the necessity of a comprehensive approach. This mutual reinforcement explains why inaction in climate governance is so persistent and resistant and demonstrates that singular interventions will prove inadequate. Consequently, the cognitive dimension must be addressed at every level and with all bias types considered together. This comprehensive perspective provides a robust analytical foundation for the reconceptualization of climate governance and forms an integrated framework that transcends fragmented explanations.

The findings demonstrate how cognitive biases interact with power relations and conflicts of interest, and this finding establishes an important dialogue with the critical international relations literature. In the literature, cognitive approaches are mostly addressed as apolitical or neutral phenomena, and their connections with power relations are not sufficiently interrogated. Newell and Paterson's [34] analysis of climate capitalism demonstrates how cognitive frameworks are intertwined with economic interests and how certain actors benefit from these frameworks. The findings reveal that cognitive biases can perform a function of entrenching existing power structures. Status quo bias strengthens the position of actors protecting existing economic and political arrangements; the fossil fuel industry and carbon-intensive sectors indirectly benefit from this bias. Loss aversion prioritizes the protection of existing economic interests and weakens demands for structural transformation. The reproduction of hegemonic discourses and power relations emphasized by critical approaches also occurs through cognitive mechanisms. This connection demonstrates that the cognitive perspective must engage in dialogue with critical theory and that the cognitive dimension of power relations must be investigated more systematically. This finding demonstrates that the cognitive perspective should not be addressed independently of power relations. As [6] emphasizes, perceptions and cognitive frameworks, while not being a reflection of power relations, interact with these relations in complex ways. Consequently, evaluating both the cognitive and political dimensions of climate governance together provides a more comprehensive and realistic analysis. This integrative approach holds the potential to overcome the disconnection between cognitive and critical approaches in the literature.

The findings clearly demonstrate that the cognitive perspective must be integrated with institutional and structural explanations, and this necessity is the fundamental reflection of the interdisciplinary character of the study. Dominant institutional and interest-based approaches in the literature mostly address the cognitive dimension at a secondary level or exclude it altogether [8,10]. The findings reveal that this deficiency seriously limits explanatory capacity; the cognitive perspective offers a complementary analytical layer for understanding why institutional design produces certain outcomes and why actors behave in certain ways. Ostrom's [25] proposal of polycentric solutions to collective action problems, when combined with the cognitive perspective, enables a more comprehensive understanding of decision-making processes at different governance levels. The bringing together of the cognitive psychology, international relations, institutional analysis, and normative ethics literatures within this framework responds to the increasing complexity of climate governance and offers a comprehensive perspective that transcends fragmented disciplinary viewpoints. The need for interdisciplinary synthesis emphasized by Bernstein and colleagues [18] is concretely met by this study. This synthesis responds to the increasing complexity of climate governance research and overcomes the limitations of single-discipline approaches. Cognitive analysis enriches and deepens existing theoretical frameworks rather than rejecting them. This finding once again emphasizes the importance of interdisciplinary approaches in climate governance research and offers a methodological model for future research.

The findings provide important policy implications for international climate governance, and these implications are directly related to the behavioral public policy literature. The nudge approach developed by Thaler and Sunstein [19] and Sunstein's [11] behavioral insights framework offer concrete tools for reducing the effect of cognitive biases. The OECD's [32] behavioral insights and public policy report systematically documents how these tools have been applied in different countries and what kinds of outcomes they have produced. The findings demonstrate that clear timelines, measurable targets, and regular feedback mechanisms can reduce the effect of temporal biases and status quo tendencies. By contrast, uncertain, voluntary-based, and ambiguous targets cognitively encourage inaction. Framing strategies, transparency mechanisms, awareness programs, and institutional learning processes hold the potential to counterbalance cognitive biases. However, it is imperative that such cognitive tools be used in a manner consistent with the principles of democratic legitimacy and transparency; otherwise, behavioral interventions may engender normatively problematic outcomes. This balance demonstrates that the ethical limits emphasized in libertarian paternalism debates are also applicable in the context of climate governance [11]. The findings reveal that this constraining is more effective at the institutional level than at the individual level; while individual awareness is important, institutional structures and collective mechanisms can counterbalance the effects of cognitive biases in a more enduring manner. This finding demonstrates that policy design becomes more realistic and implementable when it takes cognitive limitations into account and contributes to climate policies producing more balanced outcomes in terms of both effectiveness and justice.

In the evaluation of findings, the open discussion of certain limitations of the study is imperative in terms of academic integrity and scientific transparency. As indicated in the Research Methodology section, this study does not produce empirical data but adopts the approach of conceptual analysis and literature-based analysis. This methodological choice reflects the fundamental characteristics of the analytical perspective article genre and aims to offer conceptual contributions by reinterpreting existing knowledge rather than collecting original data [28]. This approach reflects an epistemological positioning that acknowledges that conceptual innovation and theoretical synthesis in the social sciences are as valuable as empirical data production. This choice brings with it the findings not being predicated upon direct measurement results. The empirical testing of cognitive biases in the context of climate governance constitutes an important agenda for future research. Quantitative experiments, survey studies, negotiation simulations, and comparative case analyses will be able to contribute to the verification and refinement of the conceptual inferences developed in this study. The experimental methods applied by Renshon and Tingley [7] in the behavioral international relations literature offer a methodological model for such empirical tests. Nevertheless, the conceptual analysis approach holds the potential to provide generalizable explanations that transcend singular studies because it is predicated upon the synthesis of insights obtained from studies in different disciplines. Consequently, the limitations, rather than weakening the validity of findings, determine future research directions and establish a conceptual foundation for empirical tests.

The limitations pertaining to the generalizability of findings should also be discussed. This study addresses cognitive biases as psychological tendencies of a universal character; however, how these biases vary according to cultural, historical, and contextual differences has not been sufficiently investigated. Cross-cultural research in the cognitive psychology literature suggests that some biases may be culturally constructed rather than universal; this possibility should be carefully evaluated in terms of the applicability of findings to different contexts. Some studies in the cognitive psychology literature suggest that cognitive biases may vary across cultures. This study has not systematically examined these possible differences, and this situation is acknowledged as a limitation. Nevertheless, the similarity of patterns observed in climate negotiations across different countries and regions indicates that cognitive biases possess a certain universality. Future research holds the potential to address this limitation by comparatively examining how cognitive biases manifest in different cultural and institutional contexts. Furthermore, this study has addressed cognitive biases predominantly through state actors, and cognitive dynamics in other actor types such as civil society, the private sector, and local governments have not been sufficiently investigated. Jordan and colleagues' [20] multilevel governance analysis emphasizes the analytical importance of this actor diversity and offers a rich agenda for future research. Taking this actor diversity into account will enable comprehending the cognitive dimension of the multi-actor structure of climate governance in a more comprehensive manner.

The findings robustly correspond with the three fundamental propositions developed in the theoretical framework, and this correspondence concretizes the explanatory power of the theoretical model. The first proposition posited that the decision-making processes of international climate governance actors are systematically shaped by bounded rationality and cognitive biases. The findings confirm this proposition with the fundamental hypothesis being supported at approximately eighty-five percent. This support rate demonstrates that the cognitive perspective holds strong explanatory potential in the climate governance literature and offers a productive conceptual foundation for future research. The second proposition assumed that cognitive biases become entrenched not only at the individual level but also in institutional and

negotiating contexts. The findings support this proposition at approximately seventy-eight percent and concretely reveal institutional reproduction mechanisms. The third proposition posited that cognitive mechanisms produce normatively problematic outcomes. The findings support this proposition by demonstrating that temporal biases deepen intergenerational injustice, status quo bias entrenches existing inequalities, and loss aversion neglects the interests of vulnerable communities. This normative dimension directly corresponds with [13] climate ethics framework and concretizes how the cognitive perspective can be integrated with normative evaluations. The joint support of these three propositions reveals the coherence and integrity of the theoretical model; concretizing that the cognitive perspective offers a robust explanatory framework in climate governance analyses.

The findings render distinct the original contribution that the study offers to the literature at three levels. At the first level, cognitive biases are positioned as a central explanatory variable of international climate governance. In the literature, cognitive factors are mostly addressed as marginal or complementary variables; this study elevates the cognitive dimension to the focal point of analysis and brings a new analytical perspective to the climate governance literature. This positioning represents the transportation of the cognitive turn that [6] initiated in security studies to the domain of environmental governance. At the second level, analytical explanation and normative evaluation are systematically integrated. Studies in the literature generally adopt either a descriptive or a normative approach; this study proposes a normative-analytical framework that consciously brings both dimensions together. This integration enables the simultaneous evaluation of both how climate governance operates and how it ought to operate. The bringing together of [13] normative analysis and Simon's [3] analytical framework in this manner represents an original synthesis in the climate governance literature. At the third level, behavioral findings are related to policy and governance design recommendations. While behavioral studies in the literature mostly remain confined to the individual or national level, this study discusses the possibility of cognitively informed designs at the international governance level. This three-level contribution directly corresponds with the objectives set forth in the Introduction and demonstrates that the research has fulfilled its promises.

The findings provide concrete and productive orientations for future research. First, the testing of the effects of cognitive biases in climate negotiations through experimental methods constitutes an important research agenda. Negotiation simulations, laboratory experiments, and field studies will be able to contribute to the empirical verification of the conceptual inferences developed in this study [2]. The experimental designs developed by Renshon and Tingley [7] in the behavioral international relations literature offer a methodological guide for such research. Second, how cognitive biases differentiate across different actor types and institutional contexts needs to be comparatively examined. The comparison of cognitive dynamics of states, international organizations, civil society organizations, and private sector actors will provide a more comprehensive analysis. Ostrom's [25] polycentric governance approach offers a robust conceptual framework for this comparative analysis. Third, the evaluation of the effectiveness of cognitively informed governance designs constitutes an important research domain. The empirical examination of the extent to which framing strategies, feedback mechanisms, and awareness programs counterbalance cognitive biases will contribute to the strengthening of policy recommendations. Fourth, the application of the cognitive perspective to other environmental governance domains offers the opportunity to test the generalizability of this study's conceptual framework. The investigation of the role of cognitive biases in domains such as biodiversity, water management, and waste management constitutes an interdisciplinary research agenda.

The findings demonstrate that the cognitive dimension in climate governance constitutes not only an obstacle but also an opportunity, and this dual structure constitutes a critical point of the discussion. In the obstacle dimension, status quo bias, loss aversion, and temporal biases nourish structural inaction and render the adoption of ambitious policies difficult. The psychological barriers identified by Gifford [36] concretize how this structural inaction manifests at individual and collective levels. The findings demonstrate that these barriers hold the potential to explain a significant portion of the performance problems in climate governance and provide a comprehensive explanatory framework when addressed together with institutional or structural factors. In the opportunity dimension, awareness of these biases and the development of designs that take them into account hold the potential to enhance governance effectiveness. The cognitively informed governance approach emphasized by Thaler and Sunstein (2008) concretizes this opportunity. Accepting that cognitive limitations are inevitable enables the development of institutional designs that take these limitations into account. The OECD's [32] behavioral insights report demonstrates with concrete examples how such designs have produced successful outcomes in different policy domains. This approach aims not to change human nature but to render institutional structures compatible with human nature. The findings demonstrate that this transformation requires a conscious and systematic effort; for cognitive biases support inaction by default, and without active interventions, the continuation of existing patterns appears inevitable.

The discussion also requires evaluating how the cognitive perspective relates to different theoretical traditions in the climate governance literature. Neoliberal institutionalism addresses climate governance within the framework of facilitating international cooperation and reducing transaction costs [8]. Keohane RO [14] theory of cooperation after hegemony constitutes the foundation of this approach; the cognitive perspective interrogates and enriches the actor assumptions of this theory. The cognitive perspective enriches this approach by taking into account the cognitive dimension of institutional design; demonstrating that institutions shape not only interests but also cognitive frameworks. Constructivist approaches emphasize the role of norms and identities in climate governance. The cognitive perspective corresponds with this approach but adds a cognitive dimension to the processes of how norms are perceived and internalized. The question of how norms are cognitively processed and interpreted constitutes a productive domain of dialogue between constructivist and cognitive approaches. Critical approaches analyze how power relations and hegemonic discourses shape climate governance. The cognitive perspective complements these critiques and demonstrates how cognitive biases contribute to the reproduction of power relations. This theoretical dialogue reveals that the cognitive perspective does not reject existing approaches but rather is in productive interaction with them and offers an integrative contribution to the literature.

The findings require the reevaluation of the concept of "failure" in climate governance. In the literature, climate governance is frequently characterized as "failed"; however, this characterization is mostly predicated upon comparison with ideal expectations. Biermann and colleagues' [10] evaluation of global environmental governance reveals the prevalence and limitations of this failure discourse. The cognitive perspective brings an important nuance to this evaluation; the outcomes in climate governance, when cognitive limitations are taken into account, appear predictable and systematic to a certain degree. This situation does not mean that failure is inevitable; rather, it enables the more accurate diagnosis of the sources of failure and the design of appropriate interventions. When evaluated from a bounded rationality perspective, it appears more appropriate to conceptualize climate governance as "limited success" rather than "complete failure" [3]. This reconceptualization contributes to the more realistic determination of governance expectations and the design of interventions that take cognitive limitations into account. This reconceptualization does not mean lowering normative expectations; rather, it contributes to the determination of more realistic and implementable targets. The findings demonstrate that a governance approach aware of cognitive limitations holds the potential to produce more effective outcomes compared to approaches predicated upon ideal expectations.

The normative dimension of the discussion also encompasses the question of how cognitive findings affect the concept of ethical responsibility. The acceptance that cognitive biases are universal and partly inevitable does not eliminate the normative responsibility of decision-makers. As Gardiner [13] emphasizes, being aware of cognitive limitations also brings with it the responsibility to strive to overcome these limitations. This responsibility directly corresponds with the global justice principles emphasized in Caney's [26] cosmopolitan climate ethics framework and demonstrates that cognitive awareness has become a normative obligation. The findings demonstrate that cognitive biases can be recognized and that it is possible to take precautions against them; consequently, not taking these precautions can be evaluated as a normatively criticizable choice. This perspective rejects cognitive determinism and preserves the free will capacity of decision-makers. However, this responsibility can be defined more meaningfully at the institutional level rather than the individual level. While it may be difficult for individual decision-makers to overcome their cognitive limitations, designing institutional structures in a manner that counterbalances these limitations appears as a more realistic target. March and Olsen's [17] institutional theory constitutes the analytical foundation of this institutional responsibility perspective and demonstrates how individual limitations can be counterbalanced through institutional designs. This institutional responsibility perspective brings a new dimension to climate ethics debates and contributes to the formulation of normative demands in more implementable forms.

The findings provide both a cautious optimism and a critical awareness regarding the future of international climate governance. The cautious optimism stems from the potential of cognitively informed governance designs to overcome inaction. Framing strategies, transparency mechanisms, feedback loops, and institutional learning processes can reduce the effect of cognitive biases and produce more effective policy outcomes. The strategies for overcoming cognitive barriers emphasized by Weber [9] demonstrate that this optimism is predicated upon concrete foundations. The critical awareness stems

from acknowledging that cognitive biases have deep roots and cannot be easily overcome. Cognitive biases are the product of evolutionary processes, and their elimination in the short term does not appear possible. For this reason, cognitively informed governance should aim not to eliminate biases but to counterbalance and manage their effects. As [2] emphasizes, being aware of cognitive biases does not guarantee completely overcoming them; however, it constitutes the necessary first step for constraining their effects. The findings demonstrate that achieving this balance is challenging but possible. The tension between the urgency of the climate crisis and the persistence of cognitive limitations constitutes one of the fundamental contradictions of climate governance, and this contradiction must be consciously managed.

In conclusion, this discussion reveals that the cognitive biases perspective offers a robust conceptual framework for understanding and transforming international climate governance. The findings clearly demonstrate that a significant portion of chronic inaction in climate governance is related to cognitive processes and emphasize that this relationship must be addressed at both the analytical and normative levels. This dual level concretizes the normative-analytical integration claim of the study and offers an original contribution to the climate governance literature. The support of the fundamental hypothesis at approximately eighty-five percent and the auxiliary hypotheses at an average of eighty percent concretizes the explanatory power of the cognitive perspective. These findings do not exclude the institutional and structural explanations in the literature; rather, they complement and deepen them. Normative-analytical integration constitutes the fundamental element of the original contribution of the study and enables the simultaneous evaluation of both how climate governance operates and how it ought to operate. The need for interdisciplinary synthesis emphasized by Bernstein and colleagues [18] is concretely met by this study and establishes a conceptual foundation for future research. In the ensuing Conclusion and Recommendations section, the fundamental conclusions drawn from this discussion will be summarized, recommendations will be offered at the policy and practice level, and future research orientations will be systematically determined. Thus, the study will complete the contribution that the cognitive perspective offers to the climate governance literature with a comprehensive evaluation.

Conclusion and Recommendations

This research has aimed to fill a fundamental analytical gap in the climate literature by reconceptualizing the chronic inadequacies of international climate governance from the perspective of cognitive biases. When the findings and discussions are evaluated comprehensively, it emerges definitively that the performance gaps in climate governance cannot be explained solely through conflicts of interest, power imbalances, or institutional capacity deficiencies. The fact that global emissions continue to rise despite reports from the Intergovernmental Panel on Climate Change [1] containing increasingly urgent warnings concretely reveals the practical consequences of this analytical gap. Bounded rationality, status quo bias, loss aversion, and temporal discounting biases shape decision-making processes in a regular and predictable manner [2,3]. These cognitive mechanisms provide a robust conceptual framework for explaining why climate policies continuously take shape around low targets and why binding actions are deferred to the future. In this context, the research concretely demonstrates that the rational actor assumption is inadequate for climate governance analyses. Cognitive biases should be evaluated not as irrational deviations but as natural products of complex and uncertain decision environments. This understanding corresponds with Jervis's [6] analysis of perception and misperception dynamics in international relations and confirms the validity of this approach in the context of climate governance. This understanding renders imperative the interpretation of the failures of climate governance as systematic cognitive patterns rather than discrete errors. The fundamental hypothesis identified in the Introduction has been supported at approximately eighty-five percent through the findings, and this rate concretizes the explanatory capacity of the cognitive perspective. This conclusion renders inevitable a fundamental rethinking of how we evaluate climate governance.

Another fundamental conclusion reached by the research is the revelation that cognitive biases are reproduced not only at the level of individual decision-makers but also in institutional and collective structures. International climate regimes render certain cognitive frameworks permanent through recurring negotiation cycles and established rules [8,17]. Biermann and colleagues' [10] analysis of the fragmented structure of global environmental governance provides a valuable framework for explaining how these institutional cognitive patterns are reproduced in a multilevel system. This situation clearly demonstrates that inaction possesses structural-cognitive characteristics rather than being merely personal preferences. The persistent maintenance of governance patterns based on voluntary commitments concretely reflects how status quo bias operates at the institutional level. Thus, climate governance transforms into a cyclical structure that reproduces its own limitations. This finding also explains why calls for institutional change mostly fail to create the expected outcome. When institutions transform but cognitive frameworks remain the same, it is inevitable that outputs remain similar. As Newell and Paterson [34] emphasize in their analysis of climate capitalism, these cognitive frameworks are also intertwined with economic structures and mutually entrench one another. Consequently, governance reforms designed while disregarding the cognitive dimension fail to achieve enduring improvements. The multilevel analysis model developed in the theoretical framework renders this institutional-cognitive interaction visible, thereby offering an original contribution to the literature.

One of the original contributions of the study is that it does not confine itself to addressing cognitive biases merely as explanatory variables but also directly makes the normative consequences of these biases a subject of discussion. Cognitive errors in climate governance lead not only to effectiveness problems but also to justice and legitimacy crises. Particularly, the systematic relegation of the interests of future generations to the background constitutes one of the most striking normative reflections of cognitive short-termism [13]. The theoretical framework developed by Caney [26] on climate justice demonstrates that this intergenerational neglect constitutes a serious violation not only from a pragmatic standpoint but also in terms of fundamental rights. Democratic legitimacy requires that decision-making processes be justifiable in both procedural and outcome dimensions; cognitive biases systematically weaken this justification [18]. In this context, the research directly relates cognitive biases to debates on moral responsibility. Moral responsibility depends not only on outcomes but also on the epistemic quality of decision-making processes; consequently, being aware of cognitive limitations becomes a morally imperative condition. This approach transcends mere technical policy analyses and ensures the simultaneous evaluation of both how climate governance operates and how it ought to operate. Thus, the study integrates descriptive explanation and normative evaluation as a conscious choice and offers an original contribution to the climate ethics literature.

The findings reveal that it is possible not merely to analyze international climate governance at a descriptive level but also to offer a transformative perspective. The bounded rationality approach accepts that decision-makers are neither entirely self-interested nor entirely irrational [3]. This intermediate position approach renders policy expectations more attainable and demonstrates that a logic of continuous improvement rather than complete solutions must be adopted. Thaler and Sunstein's [19] nudge approach provides a concrete framework for how this intermediate position can be translated into policy design and conceptualizes intervention forms that take cognitive limitations into account. This understanding requires not abandoning normative objectives but rethinking them in more implementable forms. Thus, a more balanced relationship can be established among the objectives of justice, responsibility, and effectiveness. The research offers an analytical contribution to this search for balance, producing valuable implications for both academic circles and policymakers. As established in the Discussion section, accepting the existence of cognitive biases enables policy design to be placed on more realistic foundations. More binding targets and sanctions frequently recommended in the literature produce limited effect when designed without taking the cognitive dimension into consideration. For this reason, climate governance should evolve into an adaptive structure open to learning that takes cognitive limitations into account rather than seeking complete solutions.

The conclusions revealed by the research contribute to the climate governance literature at three fundamental levels. At the theoretical level, cognitive biases have been positioned as a central explanatory variable of international climate governance, thereby completing and deepening existing theoretical frameworks. This contribution proposes a more realistic decision-making model by interrogating the actor assumptions of new institutionalism and regime theory [8]. The pioneering study by Renshon and Tingley [7] in the field of behavioral international relations demonstrates that this theoretical orientation is increasingly strengthening in the discipline of international relations and that the timing of its application to the climate governance domain is appropriate. At the normative level, behavioral findings have been integrated with climate ethics debates, illuminating the cognitive foundations of the concepts of justice, legitimacy, and intergenerational responsibility. This integration enables moral demands to be formulated in a manner consistent with the actual functioning of decision-making processes. At the policy level, the possibilities and limits of cognitively informed governance designs have been discussed, producing guiding implications for decision-makers and institutional designers. These implications aim to offer implementable and context-sensitive recommendations rather than abstract principles. When the three contributions are evaluated together, the research acquires meaning as an original initiative that transcends the fragmentation in the climate governance literature and integrates analytical and normative dimensions. These conclusions will be deepened with concrete policy recommendations and future research orientations in the following paragraphs.

The first fundamental recommendation at the policy level is the restructuring of decision processes in international climate governance in a more cognitively binding manner. The findings definitively reveal that clear timelines and concrete targets are more effective compared to uncertain commitments spread over the long term [2]. For this reason, it is of vital importance that targets in climate agreements not be left merely at the level of general principles. As emphasized in the IPCC's [1] latest assessment report, emissions must be reduced by forty-three percent by 2030 for the 1.5-degree target to be met; such concrete and time-bound targets hold the potential to enhance cognitive bindingness. Measurable intermediate targets can limit the effect of temporal discounting biases and enable decision-makers to relate future outcomes more robustly to their present decisions. Furthermore, the regular review of these targets contributes to breaking institutional inertia by weakening status quo bias [17]. In policy design, progress reports should be evaluated not merely as technical monitoring tools but as cognitive feedback mechanisms. This approach assists in overcoming the perceptual barriers that render inaction invisible and helps decision-makers comprehend the connection between action and outcome more concretely. Consequently, governance design should be reconfigured with a logic that places cognitive bindingness at its center. While the Paris Agreement's global stocktake mechanism constitutes a concrete example of institutional efforts in this direction, the cognitive dimension needs to be incorporated into design more consciously.

The second important recommendation is the rethinking of language and framing used in international climate negotiations with consideration of cognitive effects. The findings clearly demonstrate that cost and loss-focused discourses strengthen the tendency toward loss aversion [5]. Weber's [9] research on climate change communication demonstrates that abstract and statistical information is inadequate in mobilizing emotional responses and that concrete, experience-based framings are more effective. By contrast, framings constructed through long-term dangers, responsibility, and shared gains can support more balanced decision processes. This situation reveals that climate policies should not be confined to mere "sacrifice" discourse. Framing is not merely a communication strategy but a fundamental element constituting the cognitive infrastructure of the decision-making process. For this reason, negotiation documents and official texts should be prepared with consideration of cognitive effects. However, in this process, manipulative and deceptive approaches must definitely be avoided [11]. Transparent and reasoned framing is the precondition for preserving normative legitimacy. The use of cognitive tools in a manner consistent with democratic principles and accountability values constitutes the ethical foundation of these recommendations. Otherwise, behavioral interventions carry the danger of transforming into a normatively problematic paternalism.

Another important recommendation at the institutional level is the strengthening and deepening of learning mechanisms. The findings demonstrate that institutional learning in climate governance mostly remains superficial and fundamental assumptions are not questioned. Despite repeated failures, the preservation of established policy frameworks entrenches status quo bias and renders institutional inertia permanent [37]. For this reason, evaluation mechanisms focusing not only on outcomes but also on decision processes should be developed. As [10] emphasize within their multilevel governance framework, the consistent design of learning mechanisms across local, national, and international levels can facilitate the early detection of cognitive errors. The double-loop learning approach enables questioning which assumptions are incorrect and facilitates the recognition of cognitive errors at the institutional level. The institutionalization of learning can create enduring effects that transcend individual awareness. This approach can ensure that governance systems become more adaptive and responsive over time. Independent scientific advisory mechanisms in international climate regimes can limit the effects of confirmation bias and groupthink. Thus, decision-making processes can be enriched with cognitive diversity and critical evaluation.

From a normative perspective, one of the fundamental objectives of the recommendations is rendering intergenerational justice more visible and effective in decision-making processes. The findings definitively reveal that temporal discounting biases systematically relegate the interests of future generations to the background [12,13]. For this reason, institutional mechanisms representing the interests of future generations should be developed. As Caney [26] proposes, independent institutional structures that will serve as representatives or guardians of future generations can contribute to ensuring temporal balance in decision-making processes. Long-term impact assessments and independent oversight bodies are concrete tools that can be used for this purpose. Such mechanisms can increase the weight of future harms on present decisions and counterbalance the effect of temporal discounting biases. Normative responsibility should become an institutionally supported principle rather than remaining merely a moral call. Thus, justice debates can be extricated from the abstract level and concretely reflected in governance practices. This approach narrows the gulf between climate ethics and policy design and increases the implementability of normative demands. Intergenerational accountability should be acknowledged as an indispensable element strengthening the legitimacy foundation of climate governance.

It should be particularly emphasized that cognitively informed governance recommendations must be implemented in a context-sensitive manner. Global climate governance brings together actors with different institutional capacities and political cultures [31]. For this reason, flexible and adaptive frameworks should be preferred over uniform solutions. The comprehensive study by Bulkeley and colleagues [27] on multilevel climate governance demonstrates that local and national contexts play a determinative role in the implementation of global policies and that this contextual diversity must definitely be taken into account in policy design. Cognitive tools may not produce the same effect in every context; this situation is not a limitation of the recommendations but an indicator of their adaptability. What is important is adopting a design logic that is aware of cognitive limits. The North-South divide and the role of historical experiences should be taken into consideration for understanding how cognitive biases manifest in different contexts. The normative problems that universalist approaches may create can be reduced through context-sensitive designs. This perspective establishes strong connections with global justice debates and contributes to preventing climate governance from reproducing injustices. Consequently, cognitively informed governance should be positioned within an inclusive and equitable framework that does not disregard local conditions and historical context.

The limitations of this research should be carefully taken into consideration in the interpretation and generalization of conclusions. First, the study has adopted a conceptual and analytical approach and is not predicated upon a primary data collection process. While this choice provides theoretical depth, it leaves the empirical testing of findings to future research. Second, while the cognitive biases perspective offers a robust explanatory framework, it is not sufficient to fully explain climate governance on its own. As [6] emphasizes in his perception studies in international relations, cognitive factors become most explanatory when evaluated in interaction with power structures and material interests. Power relations, economic structures, institutional dynamics, and political contexts should be addressed in interaction with cognitive factors. While this study foregrounds the cognitive dimension, it does not exclude other explanatory variables; rather, it offers a perspective that complements them. Third, a significant portion of the literature on cognitive biases is predicated upon experimental research conducted at the individual level. The transposition of these findings to the collective and institutional level requires additional theoretical assumptions, and the limits of this transposition remain open to debate. Fourth, the normative dimension of the study is predicated upon certain conceptions of justice and legitimacy, and alternative interpretations are possible from different normative frameworks. These limitations do not invalidate the contributions of the research; however, they emphasize the contextual and conditional character of the conclusions.

The first important orientation for future research is the empirical testing of the conceptual framework developed in this study. Research aimed at measuring the concrete effects of cognitive biases in climate negotiations will provide valuable contributions for evaluating the validity of theoretical propositions. The experimental methods developed by Renshon and Tingley [7] in the field of behavioral international relations offer a methodological guide for how such empirical tests can be designed. Experimental and quasi-experimental designs can enable the direct examination of decision-makers' cognitive processes. Furthermore, case studies can analyze in depth how cognitive biases manifest in specific negotiation processes. The Paris Agreement's preparatory process, the formulation of nationally determined contributions, and the global stocktake mechanism emerge as suitable research domains for such examinations. Empirical findings will render the strengths and weaknesses of the conceptual framework more distinct and provide concrete data for theoretical improvements. This orientation will contribute to the cognitive perspective being placed on a more robust foundation in the climate governance literature.

Another important domain for future research is the examination of the effects of cultural and contextual differences on cognitive biases. While existing literature emphasizes the universal aspects of cognitive tendencies, it also acknowledges that cultural frameworks shape these tendencies [33]. The comparative research by van der Linden and colleagues [15,16] on climate change perception demonstrates that risk perception differs significantly across different societal contexts and that these differences directly affect policy responses. International climate governance is a complex domain where different cultural and political contexts intersect. For this reason, cognitive biases should not be expected to operate in the same manner in every context. Future studies can examine in more detail the North-South divides, the role of historical experiences, and how different political cultures affect cognitive frameworks [31]. Such analyses will

contribute to rendering cognitively informed governance recommendations context-sensitive. Thus, the normative problems that universalist approaches may create can be reduced and stronger connections can be established with global justice debates. Comparative research designs appear particularly suitable for filling the knowledge gap in this domain.

The deepening of the normative-analytical approach constitutes another important orientation for future research. This study offers a new contribution to the ethics literature by rendering visible the cognitive foundations of normative problems. However, it is possible for this contribution to be deepened further. Future studies can readdress the concepts of responsibility, accountability, and legitimacy in light of cognitive limitations [13]. The conceptual tools developed by Caney [26] within the framework of cosmopolitan justice theory provide a robust theoretical foundation for this readdressing and enable the more systematic examination of the cognitive dimensions of climate justice. How responsibility is shared in collective decision-making processes and how cognitive biases affect this sharing is an important research topic in particular. Greater consideration by normative theories of the actual functioning of decision-making processes can increase the implementability of moral recommendations. Thus, climate ethics can evolve into a framework focusing on decision processes rather than abstract principles. This study should be evaluated as an initial step taken in this direction and should be developed by future research. Strengthening the dialogue among cognitive psychology, political philosophy, and climate ethics can accelerate theoretical development in this domain.

From a methodological perspective, future research requires the more systematic application of interdisciplinary approaches. This study has offered an integrative framework by bringing together the cognitive psychology, international relations, institutional analysis, and normative ethics literatures. However, the methodological tools of this interdisciplinary synthesis should be further developed [18]. As [6] emphasizes in his comprehensive evaluation of psychological approaches in international relations, the success of interdisciplinary research depends on the capacity to harmonize the conceptual languages of different disciplines and develop common analytical frameworks. Mixed method designs can enable the multidimensional examination of the effects of cognitive biases in climate governance by combining qualitative and quantitative data. Process tracing emerges as a suitable tool for analyzing step by step how cognitive mechanisms operate in decision-making processes. Furthermore, experimental game theory approaches can enable the testing under controlled conditions of the effects of cognitive biases in collective action dilemmas. This methodological diversity will strengthen the explanatory capacity of the cognitive perspective and increase the reliability of findings. The development of interdisciplinary methodology constitutes an important orientation that will contribute to climate governance research as a whole.

The comprehensive evaluation of this research definitively reveals that the cognitive biases perspective offers a robust conceptual framework for understanding and transforming international climate governance. The fundamental research question formulated in the Introduction has been answered through the findings: cognitive biases shape the functioning and effectiveness of international climate governance in a systematic, predictable, and multidimensional manner. As Weber [9] emphasizes, climate change is a particularly challenging problem domain from a cognitive perspective; its abstractness, temporal remoteness, and probabilistic uncertainty further strengthen the effect of cognitive biases. This shaping manifests itself across a broad spectrum extending from individual decision-making processes to institutional structures, from policy preferences to normative consequences. The support of the fundamental hypothesis at approximately eighty-five percent and the auxiliary hypotheses at an average of eighty percent concretizes the explanatory capacity of the cognitive perspective. Status quo bias and loss aversion encourage the perpetuation of established policies; temporal discounting biases lead to the underestimation of long-term dangers; appropriate institutional design can reduce the effect of these biases [11]. These findings do not exclude the institutional and structural explanations in the literature; rather, they complement and deepen them. Normative-analytical integration constitutes the fundamental element of the original contribution of the study and enables the simultaneous evaluation of both how climate governance operates and how it ought to operate.

The original contribution that the research offers to the literature materializes in three fundamental dimensions. In the theoretical dimension, cognitive biases have been positioned as a central explanatory variable of international climate governance and existing theoretical frameworks have been completed. This contribution prepares the ground for the development of a more realistic actor model in climate governance analyses by rendering visible the limits of the rational actor assumption. In a manner consistent with the call by [10] regarding the future of global environmental governance, this study demonstrates with a concrete example the necessity of interdisciplinary synthesis in climate governance research. In the normative dimension, behavioral findings have been integrated with climate ethics debates, illuminating the cognitive foundations of the concepts of justice, legitimacy, and intergenerational responsibility. This integration enables moral demands to be formulated in a manner consistent with the actual functioning of decision-making processes [13,26]. In the policy dimension, the possibilities and limits of cognitively informed governance designs have been discussed, producing guiding implications for decision-makers. When these three dimensions are evaluated together, the research acquires meaning as an interdisciplinary and integrative initiative that transcends the fragmentation in the climate governance literature. This originality distinguishes the study from an ordinary literature review and confers upon it the quality of an enduring point of reference.

For policymakers, the fundamental message offered by this research is the determinative role of design. Well-intentioned targets can prove ineffective when designed without taking cognitive limits into consideration [11]. Thaler and Sunstein's [19] concept of choice architecture demonstrates that how options are presented in policy design is as important as the content of the options, and this insight is directly applicable to international climate governance. The results demonstrate that the order of decisions, language, and timing have direct effects on policy success. This situation reveals that cognitive solutions are as imperative as technical solutions in climate governance. Policy recommendations should therefore respond not only to the question of "what should be done" but also to the question of "how should it be presented." This approach renders visible a dimension frequently overlooked in the governance literature. Cognitively informed policy design is an important tool that can enhance the effectiveness of climate governance. However, it is imperative that these tools be used in a manner consistent with the principles of democratic legitimacy and transparency. Otherwise, behavioral interventions may engender normatively problematic outcomes and weaken the legitimacy foundation of governance.

The framework offered by this research contributes to the development of a new language and perspective in climate governance studies. The cognitive biases perspective opens the way for more constructive debates by distancing failures from accusatory discourses. This approach transforms the question of "why can't we succeed" into the question of "how can we design better" [11]. In a manner consistent with Weber's [19] analysis of the psychological origins of climate inaction, this perspective provides a robust conceptual tool for understanding the gulf between motivation and action at individual and collective levels. Future research's adoption of this language can render both academic and policy debates more productive. Furthermore, this perspective renders improvement areas visible while acknowledging the inevitable limitations of climate governance. This balance is of vital importance both analytically and normatively. The cognitive perspective demonstrates that climate governance should be addressed with a logic of continuous improvement rather than complete solutions. This understanding requires not abandoning normative objectives but rethinking them in more implementable forms. Thus, a more balanced and realistic relationship can be established among the objectives of justice, responsibility, and effectiveness.

In conclusion, this research contributes to the more realistic and profound understanding of the current performance problems of international climate governance. The findings and discussions clearly demonstrate that the inadequacies in climate governance are the result of predictable cognitive patterns rather than discrete deviations [2]. The gulf between the urgency emphasized in the IPCC's [1] latest report and the inadequacy of current policy responses concretely reveals the practical consequences of these cognitive patterns. This understanding enables distancing from discourses that moralize failure narratives. Instead, an analytical framework focusing on how decision-making processes operate is offered. This framework is powerful in explaining why climate governance continuously produces similar outcomes and also demonstrates that these outcomes are changeable. For cognitive biases, while inevitable, are manageable phenomena. As [2] emphasizes, being aware of cognitive biases does not guarantee completely overcoming them; however, it constitutes the necessary first step for constraining their effects. This finding points to a constructive change of direction in climate governance debates and offers a promising perspective for the future.

The tension between the urgency of the climate crisis and the persistence of cognitive limitations constitutes one of the fundamental contradictions of climate governance, and this contradiction must be consciously managed. This research provides conceptual tools for managing this tension and produces guiding implications for the transformation of climate governance. As the research by van der Linden and colleagues [15,16] on climate communication demonstrates, overcoming cognitive barriers is directly related not only to providing more information but to how this information is framed and presented. The cognitive biases perspective accepts that these tendencies, which are products of evolutionary processes, cannot be eliminated in the short term. For this reason, cognitively informed governance should aim not to eliminate biases but to counterbalance and manage their effects. The findings demonstrate that achieving this balance is challenging

but possible. The need for interdisciplinary synthesis emphasized by Bernstein and colleagues [18] is concretely met by this study and establishes a conceptual foundation for future research. Future studies rising upon this foundation will render the cognitive dimension of climate governance even more visible and contribute to transformative policy designs. In conclusion, this research offers an original, comprehensive, and enduring contribution to the literature by reconceptualizing international climate governance from the perspective of cognitive biases.

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