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# THÈSE

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# Ambidexterity across organizational levels – a study of its multilevel antecedents and outcomes

*L'ambidextrie à travers les niveaux organisationnels - l'étude de ses antécédents et conséquences multiniveaux*

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*At the heart of science is an essential balance between two seemingly contradictory attitudes—an openness to new ideas, no matter how bizarre or counterintuitive, and the most ruthlessly skeptical scrutiny of all ideas, old and new. This is how deep truths are winnowed from deep nonsense.*

*Carl Sagan, The Demon-Haunted World (1995)*

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Morgane Loquen

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# Résumé


**Introduction**

Regarder vers le passé tout en anticipant l'avenir a toujours été un défi considérable pour les organisations. Aujourd'hui vient se rajouter la complexité des exigences commerciales et des attentes sociétales, pesant lourdement sur la progression des activités. Dans ce contexte, l'ambidextrie organisationnelle se révèle être une qualité essentielle permettant aux entreprises de naviguer à travers les tensions organisationnelles. Bien que cette capacité organisationnelle ne puisse pas fournir une solution immédiate aux défis actuels auxquels les entreprises sont actuellement confrontées, elle est présentée comme un atout majeur devant être développé pour mieux gérer les contradictions et saisir les nouvelles opportunités. La conciliation de l'exploration et de l'exploitation peut être réalisée à différents niveaux organisationnels, en revanche il existe peu de travaux empiriques sur la manière de le faire.

Le principal objectif de cette thèse est d'examiner le sujet de l'ambidextrie selon une perspective multiniveau afin de mieux comprendre les interactions entre les différents niveaux d'analyse, les phénomènes, les prédicteurs et les résultats. L'analyse au niveau organisationnel est le niveau de référence de cette étude, complété par les niveaux inférieurs et supérieurs, liés aux individus, aux équipes, aux unités commerciales et aux relations interorganisationnelles. Cette recherche vise à expliquer l'ambidextrie et ses relations entre différents niveaux d'analyse considérant les différentes entités des entreprises comme étant agrégées et imbriquées dans différents systèmes. L'objectif de l'analyse multiniveau est de mieux comprendre les fonctions et les rôles joués par les différents niveaux agrégés dans le système considéré, plutôt que d'identifier uniquement les caractéristiques spécifiques pouvant influencer un comportement particulier à un seul niveau d'analyse.

Le mot "ambidextrie" vient du latin "ambos", signifiant "les deux", et "dexter", signifiant "droit", en contraste avec "gauche". L'origine du sens de l'ambidextrie est d'être "droit des deux côtés". Bien que Duncan (1976) soit le pionnier de l'étude de l'ambidextrie organisationnelle, nous nous référons à March (1991) en ce qui concerne la définition des activités d'exploration et d'exploitation. L'ambidextrie organisationnelle a d'abord été utilisée par Duncan (1976), puis March (1991) a catalysé le concept en différenciant les activités d'exploitation et d'exploration.

D’une part, les activités d'exploitation se réfèrent à l'utilisation, à l'élargissement ou à l'amélioration des produits, compétences ou processus actuels de l’entreprise (Lennerts et al., 2020; Raisch & Birkinshaw, 2008). D'autre part, l'exploration implique la recherche active et l'acquisition de nouvelles connaissances qui pourraient potentiellement ouvrir de nouvelles opportunités commerciales pour l'organisation (Gupta et al., 2006). En comparant ces deux activités, on constate que l'exploitation est bénéfique dans le contexte de la rentabilité à court terme, tandis que l'exploration sert d'investissement pour atteindre des profits à plus long terme (O’Reilly & Tushman, 2013). Une telle définition simple masque en réalité la difficulté pour les individus et les organisations de développer concrètement une certaine forme d'ambidextrie. En effet, la difficulté réside dans l'appréciation du niveau de compromis entre l'exploration et l'exploitation, puis dans la tentative de résoudre le conflit de manière significative.

**Ancrage théorique et conceptuel**

Un des récents développements sur l'ambidextrie est l'analyse de cette capacité sous une perspective multiniveaux. Ces derniers temps, la recherche a considérablement avancé en adoptant cette approche multiniveau, aidant ainsi les gestionnaires et les décideurs à orienter leurs efforts vers des domaines spécifiques. Une raison d'adopter une perspective multiniveau est d'identifier et de comprendre les relations entre les différents niveaux organisationnels. En effet, révéler les interactions entre niveaux est essentiel pour obtenir une compréhension holistique de l'émergence de l'ambidextrie, car l'ambidextrie organisationnelle est un phénomène multiniveaux par nature, pouvant émerger à la fois par des processus descendant et ascendant (Mom et al., 2019).

La pensée multiniveaux s'appuie sur le paradigme organisationnel, selon lequel les organisations sont composées de plusieurs systèmes de gestion emboîté, et se concentrant spécifiquement sur la façon dont ces systèmes sont structurées en arrangements imbriqués (Hitt et al., 2007). Cette perspective multiniveaux implique l'étude de différents niveaux analytiques pour favoriser l'ambidextrie à travers les différentes couches organisationnelles, ce qui inclut les niveaux inférieurs, appelés microfondations (Balarezo & Nielsen, 2022) - comprenant des niveaux plus bas tels que les domaines d’activité stratégiques (Birkinshaw & Gibson, 2004), le groupe ou l'équipe (Jansen, Kostopoulos, Mihalache, & Papalexandris, 2016), ou le niveau individuel (Keller & Weibler, 2015).

Dans la littérature sur l'ambidextrie multiniveaux, nous avons identifié plusieurs lacunes de recherche qui méritaient d'être investiguées. Ces lacunes de recherche sont alors détaillées afin de justifier les questions de recherche abordées dans cette thèse. Notamment, Hitt et al. (2007) ont souligné l'importance des études multiniveaux, suggérant que se limiter à des investigations à un seul niveau sur l'ambidextrie pourrait restreindre la compréhension du phénomène. Cette limitation découle d'une sous-évaluation des interactions entre niveaux et d'une généralisation excessive des effets des antécédents limités à un seul niveau (Rousseau, 1985). Malgré une connaissance approfondie des antécédents et des résultats de l'ambidextrie, il existe encore un manque de connaissances concernant l'ambidextrie à travers les niveaux d'analyse, en particulier en ce qui concerne les études empiriques. A ce sujet, plusieurs chercheurs ont également souligné la nécessité de mener davantage d'études multiniveaux (Birkinshaw & Gupta, 2013; Junni et al., 2013; Lavie et al., 2010).

Dans le chapitre 1, nous reconnaissons que plusieurs revues de littérature antérieures ont abordé l'aspect multiniveau de l'ambidextrie, mais aucune n'a examiné les études multiniveaux sur l'ambidextrie de manière systématique. Or, plusieurs auteurs ont reconnu la nature interconnectée des antécédents de l'ambidextrie entre différents niveaux d'analyse en raison des systèmes organisationnels emboîtés comme présenté précédemment. En s'appuyant sur la revue de littérature de Raisch & Birkinshaw (2008), cette étude enrichie la littérature multiniveaux sur l'ambidextrie. En répondant aux suggestions de Kassotaki et al. (2019), Pertusa-Ortega et al. (2019), et Christofi et al. (2021), la revue de littérature systématique du chapitre 1 examine la relation entre l'ambidextrie et les différents niveaux et propose un cadre conceptuel englobant à la fois les perspectives micro et macro (Christofi et al., 2021; Kassotaki et al., 2019; Pertusa-Ortega et al., 2020).

Le chapitre 2 de cette thèse est en lien avec le chapitre précédent en adressant le manque de recherche que Chang (2016) suggère : "les futures recherches pourraient explorer les études multiniveaux sur l'interaction entre individus, entreprises et industries" pour compléter son étude portant sur le niveau de l'unité et de l'entreprise (p. 440). Cette piste permettrait de répondre au besoin de plus d'investigations sur l'interaction entre individus ambidextres et organisations ambidextres, en adoptant une approche multiniveau, comme le préconise Mom et al. (2019). De plus, ce besoin découle d'une limitation significative des recherches antérieures qui utilisent rarement des échelles fiables pour mesurer l'ambidextrie à plusieurs niveaux d'analyse. À notre connaissance, nous considérons l'étude de Mom et al. (2019) comme la seule utilisant des échelles fiables d'ambidextrie à deux niveaux d'analyse : l'individu et

l'organisation. Cela reste limité car plusieurs études utilisent généralement un proxy ou une forme agrégée d'ambidextrie à un autre niveau d'analyse.

Le chapitre 3 répond au besoin suggéré par Kobarg et al. (2017) qui déclare que des recherches supplémentaires devraient continuer dans sa direction en examinant également les résultats de performance aux niveaux individuel et organisationnel. La performance est particulièrement importante en tant que résultat de l'ambidextrie car la littérature a souligné que les organisations ambidextres réussissent mieux que d'autres en termes de succès et de survie (Andriopoulos & Lewis, 2009). Dans la même lignée, d'autres chercheurs ont constaté que l'ambidextrie conduit à une performance supérieure (Lubatkin et al., 2006; Vrontis et al., 2017; Yu et al., 2020). Cependant, la performance organisationnelle de l'ambidextrie a principalement été associée au niveau organisationnel uniquement et aux rendements financiers. Nous constatons que d'autres critères de performance, tels que les aspects sociaux et environnementaux, n'ont pas été examinés. Ainsi, ce chapitre examine les résultats multiniveaux de l'ambidextrie liés à la performance économique, sociale et environnementale. De cette manière, il intègre les objectifs de la Triple Bottom Line (TBL) et de la Responsabilité Sociale des Entreprises (RSE).

À la lumière des lacunes existantes dans la littérature de l'ambidextrie multiniveaux, cette thèse vise à aborder la question de recherche énoncée ci-dessous :

***Quelles sont les interactions multiniveaux, les antécédents et les résultats de l'ambidextrie ?***

Plus précisément, cette étude vise à répondre aux trois sous-questions de recherche suivantes :

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| *Que savons-nous et que ne savons-nous pas sur l'ambidextrie d'un point de vue multiniveaux ?* |
| *Quel est le rôle du climat d'autonomisation organisationnelle dans l'ambidextrie multiniveau - organisationnelle et individuelle- dans l'industrie agribusiness ?* |
| *Comment l'ambidextrie multiniveaux - employé, entreprise et interorganisationnelle - est-elle liée aux performances économiques, environnementales et sociales ?* |

**Chapitre 1**

L'ambidextrie est la capacité d'une organisation, intégrée à différents niveaux organisationnels ou interorganisationnels, à équilibrer l'exploration et l'exploitation. Afin de mieux comprendre l'ambidextrie organisationnelle, ce chapitre fait l'état de l'art de l'ambidextrie multiniveaux par le biais de deux étapes. La première consiste en une enquête auprès de 36 experts internationaux permettant de mieux comprendre les recherches actuelles et besoins futures sur l'ambidextrie multiniveaux. En utilisant les avis des experts, dans une deuxième partie, une revue systématique de la littérature a été réalisée spécifiquement sur les études d'ambidextrie multiniveaux. Cinquante-neuf articles évalués par des pairs et publiés ont été analysés à partir de trois bases de données : Web of Science, Scopus et EBSCO. L'analyse des études multiniveaux révèlent différentes approches méthodologiques, mesures, antécédents et types d'ambidextrie, nos résultats révèlent également un ancrage théorique, des contextes d'étude variés et différents modèles conceptuels. Cette revue complète de l'ambidextrie contribue à la littérature en proposant un cadre où figure des relations multiniveaux ainsi que leurs approches respectives, conceptualisant ainsi les antécédents de l'ambidextrie. Les contributions de ce chapitre viennent compléter la littérature actuelle sur l'ambidextrie et les approches multiniveaux en mettant l'accent sur les connaissances existantes concernant l'ambidextrie en tant que phénomène imbriqué. Enfin, ce chapitre présente des pistes précises pour de futures recherches sur l'ambidextrie concernant les fondements théoriques, l'opérationnalisation des construits, les spécificités des niveaux d'analyse, les interactions entre les différents niveaux d'analyse et les contextes empiriques.

**Chapitre 2**

Ce chapitre porte sur l'ambidextrie multiniveaux - aux niveaux individuel et organisationnel - dans le secteur agroalimentaire. 212 paires de réponses valides de PDG et d'employés ont été recueillies lors du salon international de l'agriculture à Paris. Les résultats du modèle d'équations structurelles montrent qu'un climat d'autonomisation organisationnel joue un rôle central, en tant que médiateur de la relation entre les flux de connaissances des individus et l'ambidextrie individuelle, médiateur également de la relation entre la connexion et l'ambidextrie organisationnelle. Les contributions de ce chapitre sont triples : il enrichit les études sur l'ambidextrie multiniveaux en se concentrant sur les niveaux individuel et organisationnel, il élargit la littérature sur l'ambidextrie en mettant en évidence le rôle du climat

d'autonomisation en tant que médiateur central, et enfin il offre des perspectives managériales aux entreprises pour faire face aux dilemmes organisationnels dans le secteur agroalimentaire grâce à un climat d'autonomisation organisationnelle.

**Chapitre 3**

Cette étude se concentre sur l'ambidextrie multiniveau - individuelle, organisationnelle et interorganisationnelle - ainsi que ses conséquences en termes de performances économiques, environnementales et sociales. Les données multiniveaux ont été recueillies à l'aide de deux enquêtes distribuées aux PDG et à leurs employés respectifs. Nous nous sommes focalisés sur les entreprises en collaboration au sein d'un écosystème agroalimentaire et agricole, et ayant des activités liées aux algues, cultures, utilisation agricole, ou transformation. A partir des réponses de 32 entreprises et 304 employés individuels, nos résultats indiquent que l'ambidextrie des employés - au niveau individuel – a un effet de médiation partielle sur la relation entre le partage des connaissances des employés et la conscience environnementale individuelle. Contrairement à des études antérieures, nos données ne renforcent pas la relation entre l'ambidextrie organisationnelle et la performance économique de l'entreprise, mais soutiennent la relation entre l'ambidextrie organisationnelle et la performance environnementale. Nous avons obtenu des résultats comparables au niveau interorganisationnel - sous les tensions spécifiques à l'industrie - car l'ambidextrie interorganisationnelle est positivement liée à la performance environnementale interorganisationnelle mais pas à la performance économique interorganisationnelle. Les résultats de notre approche microfondée suggèrent une forte relation entre les niveaux organisationnel et interorganisationnel, mais aucune interaction significative entre les niveaux individuel et organisationnel en ce qui concerne l'ambidextrie et les performances économiques, environnementales et sociales. Notre étude offre trois principales contributions. Premièrement, elle enrichit les connaissances actuelles sur l'ambidextrie individuelle (qui impacte significativement la relation entre le partage des connaissances et la conscience environnementale). Deuxièmement, en comblant les lacunes de recherche entre l'ambidextrie et ses résultats économiques, environnementaux et sociaux, nous révélons que l'ambidextrie est bénéfique uniquement pour la performance environnementale aux niveaux individuel, organisationnel et interorganisationnel. Troisièmement, nous enrichissons la littérature existante sur l'ambidextrie multiniveau. Nous avons examiné les liens entre les niveaux individuel, organisationnel et interorganisationnel en utilisant un cadre ‘double bathtub’. Enfin, nous proposons des recommandations managériales

pour aider les réseaux vertueux de parties prenantes à effectuer leur transition vers une durabilité accrue et une performance environnementale.

**Résultats et contributions**

Tout d'abord, les résultats s'inscrivent dans la discussion des interactions multiniveaux. Les caractéristiques de l'ambidextrie ont souvent été étudiées de manière isolée. Cependant, les niveaux d'analyse sont liés car ils sont intrinsèquement imbriqués. Un niveau d'analyse est étroitement lié au niveau immédiatement supérieur et inférieur chaque fois que possible. Une exception serait le niveau individuel, qui ne peut être relié à un niveau inférieur. Il en va de même pour le niveau interorganisationnel et l'impossibilité d'étudier le niveau supérieur. Nous soutenons que la portée des niveaux d'analyse devrait inclure le niveau directement lié et le plus proche, sauf pour l'utilisation de l'ambidextrie organisationnelle et sa relation avec le niveau individuel (sans considérer le niveau d'équipe ou de BU). Relier directement le niveau organisationnel au niveau individuel pourrait être méthodologiquement pertinent pour les PME en argumentant que la taille du système rend le niveau intermédiaire (c'est-à-dire le niveau d'équipe ou domaine d'activité stratégique) non pertinent. Sur la base des interactions multiniveaux, nous soutenons que les effets ascendants et descendants sont deux considérations qui nécessitent plus de données empiriques pour révéler le mécanisme derrière les interactions entre niveaux d'analyse. Des discussions théoriques élaborées abordent ces deux effets sur l'ambidextrie, mais peu de preuves sont présentées par les données empiriques.

En ce qui concerne les interactions multiniveaux, nous avons indiqué que les interactions sociales à tous les niveaux organisationnels jouent un rôle central dans la gestion de l'ambidextrie, car elles sont à l'origine de complémentarités pour développer l'exploration et l'exploitation, ce sont également des facilitateurs des interactions multiniveaux. Les interactions sociales comprennent la transmission des connaissances, les liens sociaux et les échanges entre les parties prenantes individuelles. Grâce à ces facteurs de relations sociales, les différents systèmes institutionnels deviennent perméables.

Les interactions multiniveaux sont également des moyens de comprendre plus profondément la causalité entre les différents arrangements imbriqués. Cette thèse a examiné les relations entre l'ambidextrie individuelle et organisationnelle. Les résultats sont divergents. Le chapitre 2 indique que l'ambidextrie individuelle est positivement liée à l'ambidextrie organisationnelle,

tandis que le chapitre 3 démontre l'absence de relation significative entre les deux variables. Une autre relation étudiée concerne les niveaux organisationnels et interorganisationnels. L'étude 3 révèle un lien positif entre les deux niveaux macro.

En ce qui concerne les antécédents de l'ambidextrie, cette thèse fournit des éléments spécifiques pour devenir ambidextre à travers l'étude de sa nature multiniveau. Le chapitre 2 met en lumière le rôle pivot d'un climat d'autonomisation organisationnelle dans les relations multiniveaux. Ce facteur est médiateur des relations entre la connectivité et l'ambidextrie organisationnelle, également médiateur de la relation entre les flux de connaissances individuelles et l'ambidextrie individuelle. Cette découverte est complétée par les résultats du chapitre 3, qui montrent que l'échange de connaissances individuelles facilite l'ambidextrie individuelle. Nous observons des résultats similaires dans les deux études empiriques qui relient l'ambidextrie aux connexions sociales. En plus de cette caractéristique commune, un antécédent supplémentaire est fourni à travers les résultats du chapitre 3. Au niveau interorganisationnel, les tensions spécifiques à l'industrie stimulent l'engagement dans l'ambidextrie interorganisationnelle. Cela signifie que lorsque l'industrie ou un réseau d'entreprises est soumis à des tensions et des contraintes importantes, les entreprises sont motivées à collaborer pour trouver un équilibre entre les activités d'exploration et d'exploitation par le biais de partenariats.

Troisièmement, cette thèse a exploré plusieurs résultats de l'ambidextrie multiniveaux. Le chapitre 3 présente une découverte novatrice concernant la relation multiniveau entre l'ambidextrie et l'engagement environnemental aux niveaux individuel, organisationnel et interorganisationnel. Bien que trois résultats significatifs de l'ambidextrie aient été présentés, il est essentiel de reconnaître d'autres constatations qui (bien qu'elles ne soient pas significatives) restent importantes, car elles contredisent les hypothèses théoriques. Ces résultats peuvent être expliqués par la théorie et les données empiriques. Au niveau d'analyse le plus élevé, l'ambidextrie interorganisationnelle a été trouvée positivement reliée à la performance environnementale, mais n'a pas eu de relation significative sur la performance économique. Ce résultat peut être justifié par l'indépendance économique des entreprises, indépendamment de leurs activités de partenariat. Cela correspond également à la motivation derrière la création de tels partenariats dans notre contexte de recherche. Au niveau organisationnel, l'ambidextrie organisationnelle a été bénéfique pour la performance environnementale, mais n'a pas de relation significative avec la performance économique et sociale des entreprises. Enfin, au niveau individuel, l'ambidextrie individuelle est positivement liée à la conscience

environnementale individuelle. En conséquence, cette étude indique qu'en examinant l'ambidextrie à travers trois niveaux d'analyse, l'engagement environnemental apparaît comme un résultat positif découlant de la capacité à gérer les tensions entre exploration et exploitation.

En proposant un cadre conceptuel, le chapitre 1 analyse la perspective multiniveau, s'appuyant sur différentes études et des approches d'ambidextrie souvent utilisées pour conceptualiser les antécédents et le contexte de l'ambidextrie. L'adoption de cette perspective complète la littérature existante sur l'ambidextrie et les approches multiniveau en explorant l'ambidextrie en tant que phénomène imbriqué. Cette contribution s'appuie sur le paradigme organisationnel de l'ambidextrie de Hitt et al. (2007), mettant en évidence divers arrangements organisationnels et interactions entre niveaux.

**Conclusion**

Cette thèse présente des recommandations pratiques pour un large éventail d'acteurs, y compris les organisations, les PDG, les managers et les employés. Étant donné que les implications managériales présentées s'appliquent principalement aux PME de l'agribusiness, les résultats visent à être étudiés dans d'autres secteurs d'activité pour être plus largement généralisés. Les implications pratiques présentées peuvent servir de guide aux entreprises pour naviguer efficacement entre exploration et exploitation. Ces implications découlent des résultats robustes des différents chapitres, interprétés grâce à l'expérience terrain accumulée lors des phases de collecte de données. En ajoutant des perspectives du monde de l'industrie aux résultats empiriques, les recommandations sont pertinentes pour les entreprises cherchant à améliorer leur ambidextrie et leur performance globale.

En conclusion, la perspective multiniveau de l'ambidextrie met en lumière des solutions pour atteindre cet équilibre, rapprochant ainsi la réflexion de la recherche de la réalité complexe des organisations.

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# List of Abbreviations

| | |
|---|---|
| BU | Business unit |
| CEO | Chief executive officer |
| CSR | Corporate social responsibility |
| e.g. | exempli gratia, for example |
| Et al. | Et alia, and others |
| i.e. | id est, that is |
| INRAE | Institut national de Recherche pour l'Agriculture, l'Alimentation et l'Environnement (National Research Institute for Agriculture, Food and the Environment) |
| MLA | Merci les Algues! |
| SLR | Systematic literature review |
| TBL | Triple Bottom Line |

# General Introduction

# 1. Research Objectives

Examining the past while forecasting the future has perpetually been a considerable challenge for organizations. Yet, now, the complexity of business demands and societal expectations weighs heavily on the progress of activities. In this context, organizational ambidexterity is an essential quality that enables companies to navigate organizational tensions. While it may not provide an immediate solution to the challenges businesses currently encounter, it is presented as a critical ability that must be developed to manage contradictions and capitalize on opportunities.

This thesis aims primarily to examine ambidexterity from a multilevel perspective. To understand the interactions between the different levels of analysis phenomenon, predictors, and outcomes more thoroughly, I consider the organizational level analysis as the baseline and complement it with lower and higher levels related to individuals, teams, business units, and interorganizational relationships. As the present research aims to explain ambidexterity and its relationships between different levels of analysis, this dissertation follows the understanding of things being aggregated and nested in various systems. Multilevel analysis aims to understand the roles played by the aggregated levels in the considered system more thoroughly rather than just identifying the specific characteristics that can influence a particular behavior (Courgeau, 2003).

Given the importance of management in agribusiness, the present research is directed toward this industry. From a research perspective, the aim is to explore the interplay between strategic management and innovation management and, in particular, to center this thesis on ambidexterity's antecedents and outcomes across different multilevel analysis perspectives in agribusiness. This work's objective is to provide theoretical and managerial insights that can support vital institutions related to agribusiness, such as the Food and Agriculture Organization of the United Nations (FAO), the International Federation of Organic Agriculture Movements (IFOAM), the World Health Organization (WHO), and their stakeholders in their decision-making processes.

# 2. Theory and Concepts

## 2.1. Ambidexterity: Conceptual Roots and Recent Developments

Ambidexterity comes from the Latin ambos (both) and dexter (right). So, the origin of the meaning of ambidexterity is to be right on both sides. Although Duncan (1976) was the pioneer in studying organizational ambidexterity, we refer to March (1991) when defining exploration and exploitation activities. Duncan (1976) argued that two structures benefit organizations: the mechanistic structure (which enables firms to implement and deploy their activities) and the organic structure (which helps firms innovate). Duncan (1976) was the first to use the term organizational ambidexterity. Later, March (1991) catalyzed the concept of differentiating between exploitation and exploration activities.

Exploitation activities refer to the utilization, enlargement, or enhancement of current products, skills, or processes (Lennerts et al., 2020; Raisch & Birkinshaw, 2008a). But exploration involves actively seeking and acquiring new knowledge that could potentially open up new business opportunities for the organization (Gupta et al., 2006). Comparing those two activities leads us to conclude that exploitation increases short-term profitability, whereas exploration is an investment in achieving long-term profits (O'Reilly & Tushman, 2013). This straightforward definition may belie the challenge for people and organizations to develop a specific form of ambidexterity. The difficulty is to appreciate the level of trade-offs between exploration and exploitation and then attempt to resolve the conflict meaningfully.

Organizational ambidexterity was originally used to describe a firm's ability to execute two tasks simultaneously: exploitation and exploration. But other contradictions have been examined through the ambidexterity lens, such as efficiency and flexibility, alignment and adaptability (Gibson & Birkinshaw, 2004), or incremental and radical innovation. However, this work uses the term ambidexterity stricto sensus, i.e., referring to the balance between exploration and exploitation and no other dilemma studied through the lens of ambidexterity.

Academic interest has been increased by supporting that ambidexterity explains why some firms outperform others. For instance, Andriopoulos & Lewis (2009) argued that ambidexterity helps organizations grow and survive. We know that ambidextrous firms outperform others because they can improve and refine their existing activities through exploitation. Simultaneously, they can develop entirely new activities through exploration (March, 1991).

The relationship between ambidexterity and performance is complex (Raisch & Birkinshaw, 2008a) because performance outcomes have been subject to many debates in the strategic management literature. However, Giauque et al. (2022) suggested in a simplistic yet meaningful statement that no exploitation means no production today, while no exploration means no production tomorrow.

One age-old debate surrounded the achievement of ambidexterity from a continuum or orthogonal view. According to the continuum view, exploration and exploitation represent opposing ends of a spectrum, and some firms opt to specialize exclusively in either exploration or exploitation rather than trying to balance both (Hughes et al., 2020). But an orthogonal or parallel view suggests that firms should pursue exploration and exploitation equally well. Although achieving this balance can be challenging due to limited time, financial resources, and effort, it is possible to attain substantial levels of both concurrently. We note, however, that specialization poses inherent risks: focusing only on exploitation may result in a competency trap, while exclusively pursuing exploration could lead to failure. And this is why ambidexterity facilitates short-term efficiency and long-term adaptation, which is seen as beneficial for performance.

Executing conflicting activities is a substantial challenge because of a company's limited time, money, and effort, but we agree that substantial levels can be achieved simultaneously. However, inherent specialization risks have been observed since pursuing only exploitation can lead to a competency trap, while solely executing exploration can lead to failure (Hughes et al., 2020). And this is one reason that supports ambidexterity's benefits for achieving higher performance due to short-term efficiency while ensuring long-term adaptation. However, the specific role of individuals in organizational ambidexterity remains understudied.

Balancing exploration and exploitation can be idealistic if no practical mechanism is developed. Hence, we found literature three main common approaches in the literature for studying and applying ambidexterity to an organizational context. First, the structural approach is probably the easiest to conceptualize since it relies on dual structures where different units, services, or departments are dedicated to either exploration or exploitation (O'Reilly & Tushman, 2004). Differentiating between different types of organizational groups represents a way for organizations to find an ambidextrous equilibrium. In high-technology environments, structural separation is better suited than the contextual approach for achieving a balance between exploration and exploitation (Fourné et al., 2019). We argue that structural ambidexterity is

associated with organizational levels of higher levels of analysis. Second, the temporal, also called sequential (Tushman & O'Reilly, 1996), approach involves shifting from explorative to exploitative activity, and reversely in a cycling routine. Temporary cycles, which allow firms to switch from periods of exploration to periods of exploitation, were supported by Nickerson and Zenger (2002) and Siggelkow and Levinthal (2003). In this case, ambidexterity can be studied as a process and dynamic capability (Tillement et al., 2019). Third, the contextual approach refers to the freedom of organizational members to best divide their time between exploration and exploitation (Gibson & Birkinshaw, 2004). Contextual ambidexterity is adapted for firms of a limited size with restricted resources to adopt structural solutions to ambidexterity (Lubatkin et al., 2006; Zimmermann et al., 2015). Those three main approaches help us understand the phenomenon's characteristics more thoroughly. However, their application can be debatable because they can be cumulative and complementary. And instead of relying on the presented approach, Snehvrat and Dutta (2018) found that ambidexterity results from interactions between the organizational levels. This unexpected finding contradicts the well-known forms of ambidexterity (structural, contextual, and temporal).

Regarding the interactions between levels of analysis, more recent academic work has highlighted two potential organizational effects: bottom-up and top-down. Those mechanisms can be studied in two ways, first, in considering the organizational levels interactions in a vertical view, and second, in considering the individual hierarchical levels in a horizontal perspective. In this thesis, I adopt the vertical view while keeping the organizational systems (ranging from micro individual to macro interorganizational levels) in mind.

The bottom-up approach has often been used as an argument to study individual ambidexterity in stating that individuals can make some decisions, including how to best divide their time between exploration and exploitation (Bidmon and Boe-Lillegraven, 2019). And this refers to contextual ambidexterity. Noteworthy is the fact that humans often exhibit myopic tendencies and a preference for risk aversion (Levinthal & March, 1993). Consequently, they may be more inclined to persist in familiar activities associated with exploitation rather than exploration (Laureiro-Martínez et al., 2015).

But the top-down approach is associated with executives' leadership behaviors when referring to hierarchical positions. We notice that a top-down mechanism across organizational levels can favor sequential ambidexterity because the exploitative and explorative periods are defined distinctively at the upper level to be followed by the lower-level entities.

Analyzing and comprehending ambidexterity's antecedents is crucial to developing such balance. Fourné et al.'s (2019) results indicated that it is now vital to shift the focus away from the tensions per se and instead concentrate on understanding the complementarities between exploration and exploitation and how this co-existence depends upon organizational and environmental factors. Reviewing the ambidexterity literature, Chapter 1 indicates that antecedents are level-specific, meaning that ambidexterity's predictors vary according to the level of analysis studied. Initially, we observe that structural antecedents are related to the interorganizational and organizational levels. And this implies that structural aspects, such as dual structure or the diversity of interfirm relationships, have limited relevance at lower levels. Likewise, upper-level antecedents like resources or capabilities follow a similar pattern, indicating that they do not substantially influence ambidexterity at individual and group levels.

The ambidexterity literature at multiple levels of organizational systems indicates that social interactions are crucial for fostering ambidexterity. The prevalence of social ties as antecedents can be attributed to the central role of individuals in forming these connections to develop ambidexterity. Based on this observation, this thesis encompasses social ties (including collaboration, participative leadership, empowerment climate, knowledge exchange, and connectedness). These determinants span across individual, group, organizational, or interorganizational levels.

## 2.2. Understanding the Research Interest from a Multilevel Perspective

One of the recent advances regarding ambidexterity is analyzing that ability from a multilevel perspective. Recently, research has progressed significantly by adopting the multilevel lens, thus helping managers and decision-makers direct their endeavors toward specific areas. One reason for adopting a multilevel perspective is to identify and understand the relationships between the levels. Indeed, revealing cross-level interactions is crucial for acquiring a holistic understanding of how ambidexterity emerges across various levels since organizational ambidexterity is a multilevel phenomenon that can arise from top-down and bottom-up processes (Mom et al., 2019).

Multilevel thinking revolves around the organizational paradigm nested within several management systems, specifically focusing on how corporate entities are structured as nested arrangements (Hitt et al., 2007). This multilevel perspective involves investigating various

analytical levels to foster ambidexterity throughout the different organizational layers, which includes lower levels called microfoundations (Balarezo & Nielsen, 2022) encompassing lower levels, such as business units (Birkinshaw & Gibson, 2004), group or team units (Jansen, Kostopoulos, Mihalache, & Papalexandris, 2016), or individual levels (Keller & Weibler, 2015).

The common focus on organizational ambidexterity has recently shifted to investigating individual ambidexterity by studying senior managers (Smith & Tushman, 2005), the senior team (Jansen, George, Van Den Bosch, et al., 2008; Lubatkin et al., 2006), managers (Tempelaar & Rosenkranz, 2019), or non-managerial employees (Kauppila & Tempelaar, 2016). Raisch and Birkinshaw's (2008a) and Simsek's (2009) contributions have notably increased the emphasis on multilevel studies by examining ambidexterity that permeates across different organizational levels. And García-Granero et al. (2018) recently called for further research regarding the multilevel interdependencies among individuals, groups, and organizations in acquiring and maintaining ambidexterity over time.

Despite those rationales, insufficient research exists regarding individuals' roles and influence concerning organizational ambidexterity. There are opportunities for more research concerning the interactions and relationships between micro-macro-micro. According to Felin et al. (2015), most management theories primarily focus on a single level of analysis. It is crucial to note that multilevel study requires even more rigor to define where the phenomenon should be addressed. For instance, a given concept cannot directly be applied to another level to justify the study's multilevel aspect (Felin et al., 2015).

## 2.3. Theorizing About the Microfoundational Approach

Related to multilevel thinking, we reflect and aim to contribute to the microfoundational approach. Microfoundation means that a given organizational phenomenon can be explained by the conditions of levels below the focal level of analysis where the phenomenon is studied (Felin et al., 2012; N.J. Foss & Pedersen, 2016). Microfoundation has, in particular, been used to distinguish organizational phenomena from individual-level conditions. However, microfoundation should not be limited to the organizational and individual levels because it requires defining the correct fundamental explanation of the level N phenomenon, thanks to level N-1. Foss & Pedersen (2016) recently stated that "So much successful microfoundational theory work now exists that it is fair to conclude that the major challenges to the

microfoundations research agenda are probably not theoretical in nature but perhaps rather empirical" (p. 6). This lack of empirical studies can be explained by the fact that microfoundation studies require multilevel data — or at least data representing two levels of analysis. We will see in the following methodological section that this condition represents a challenge for researchers.

## 2.4. Research Gaps and Research Questions

From the multilevel ambidexterity literature, we identified several research gaps worth investigating. Those research gaps explained in the current section lead to the research questions tackled in this thesis.

Hitt et al. (2007) emphasized the significance of multilevel studies, suggesting that only conducting single-level investigations on ambidexterity may limit our understanding of the phenomenon. This limitation arises from undervaluing cross-level interactions and overgeneralizing the effects of antecedents confined to one level (Rousseau, 1985). Despite the extensive knowledge about ambidexterity's antecedents and outcomes, knowledge regarding ambidexterity across levels of analysis is scarce, especially in empirical studies. Several scholars have also highlighted the need for more multilevel studies (Birkinshaw & Gupta, 2013; Junni et al., 2013; Lavie et al., 2010). More precisely, Linder & Foss (2018) argued that when organizational goals are embedded in multilevel systems, "inter-level processes may be crucial for understanding the emergence and nature of specific organizational goals" (p.40).

Given ambidexterity's multilevel nature and the scarcity of systematic literature review papers exploring its precursors from a multilevel perspective, Chapter 1's objective is to review the state of ambidexterity literature using multiple levels of analysis.

In Chapter 1, we acknowledge that several previous literature reviews have discussed ambidexterity's multilevel aspect, but none have systematically examined multilevel ambidexterity studies. However, various authors have recognized interconnected antecedents of ambidexterity between different levels of analysis due to organizational nested systems. Building upon Raisch & Birkinshaw's (2008) literature review, this study extends the multilevel literature on ambidexterity. Addressing calls from Kassotaki et al. (2019), Pertusa-Ortega et al. (2019), and Christofi et al. (2021), Chapter 1's systematic literature review (SLR) examines ambidexterity's relationship between different levels and proposes a conceptual framework

encompassing micro and macro perspectives (Christofi et al., 2021; Kassotaki et al., 2019; Pertusa-Ortega et al., 2020).

Chapter 2 of this thesis relates to the previous chapter by addressing the research gap Chang (2016), Simsek (2009), García-Granero, Fernández-Mesa, Jansen, and Vega-Jurado (2018), and Pertusa-Ortega, Molina-Azorín, Tarí, Pereira-Moliner, and López-Gamero (2020) identified. Chang suggested that "future research may explore multilevel studies on the interaction between individuals, firms and industries" to complement his study regarding unit and firm levels (p. 440). This research addresses the demand for more investigations into the interplay between ambidextrous individuals and organizations, adopting a multilevel approach advocated by Mom et al. (2019). Moreover, it tackles a significant limitation of previous research: it has rarely employed reliable scales to measure ambidexterity at multiple analysis levels. To the best of our knowledge, Mom et al.'s (2019) study is the only one that used reliable scales of ambidexterity at two levels of analysis: individual and organizational. And this remains limited because several studies use a validated scale complemented by a proxy or an aggregated form of ambidexterity at another level of analysis.

Chapter 3 addresses Kobarg et al.'s (2017) and Tempelaar & Rosenkranz's (2019) call, which stated that further research should continue by examining performance output at individual and organizational levels. Performance is particularly crucial as an ambidexterity outcome because the literature has highlighted that ambidextrous organizations outperform others in success and survival (Andriopoulos & Lewis, 2009). Along the same lines, other scholars found that ambidexterity leads to higher performance (Lubatkin et al., 2006; Vrontis et al., 2017; Yu et al., 2020). However, ambidexterity's organizational performance has mainly been associated with the organizational single-level and financial returns. Other performance criteria, such as social and environmental aspects, have not been examined. Thus, this chapter examines ambidexterity's multilevel outcomes related to economic, social, and environmental performance. In this way, it integrates the Triple Bottom Line (TBL) and Corporate Social Responsibility (CSR) objectives.

An additional research gap addressed concerns the interlevel interactions, especially the relationships between organizational and interorganizational ambidexterity and its outcomes, which lack knowledge from the literature. Interorganizational ambidexterity remains underexplored in multilevel research. We argue that individual, organizational, and interorganizational considerations are particularly crucial for SMEs. And to the best of our

knowledge, no published article has examined the links between those three levels in a quantitative empirical study.

Considering the current knowledge gaps on multilevel ambidexterity, this thesis intends to address the research question stated below:

***What are the multilevel interactions, antecedents, and outcomes of ambidexterity?***

More precisely, this study tackles specific research gaps raised by scholars and aims to address the three following sub-research questions (SRQs):

| |
|---|
| SRQ1: *What do we know—and not know—about ambidexterity from a multilevel perspective?* |
| SRQ2: *What is the role of organizational empowerment climate in multilevel organizational and individual ambidexterity in agribusiness?* |
| SRQ3: *How do multilevel — employee, company, and interorganizational — ambidexterity intertwined contribute to economic, environmental, and social performance?* |

Subsequently, this thesis presents explanations of the epistemological posture of the research endeavor, the methodological approaches employed, and the field of application that constitutes our research design to address the research questions presented.

# 3. Epistemology and Methodology

## 3.1. Epistemological Posture

In management, my primary focus of interest concerns the impact of innovation and strategic management on performance. More specifically, the well-known question, "Why do some firms outperform others?" often piques my interest in understanding their activities and their impact on their business more thoroughly.

Every research study is built upon philosophical foundations, which involve understanding the nature of reality under investigation (ontology) and determining the methods used to gain a deeper understanding of it (epistemology) (Van de Ven, 2007).

As a young Ph.D. candidate, it is challenging to identify myself in the pre-conceived epistemological research categories. I value certain things in research that may seem slightly ideological. I do not believe myself to be a pure positivist, viewing the world as a determinist that functions according to a cause-and-effect relationship, in line with the causal laws sought by Descartes. Among the critical conceptions I have about research is, for instance, data. Data is a crucial element for me in high-quality research. I also allot importance to social interactions between individuals within or between institutional entities. Finally, measurement is essential for producing social sciences knowledge. And measurement means quantifying, comparing, or observing evolution. Those three criteria are good conditions for investigating why some firms outperform others. For those reasons, even if we try to get as close as possible to objectivity, we cannot fully reach it. However, we can be modest about our findings in highlighting the potential research limitations and biases. If I had to select a specific research philosophy that fits my research position, I would say that I adopt a post-positivism research stand.

As part of my epistemological posture, I consider my research approach deductive. I am interested in different research objects, such as parts of my thesis, like ambidexterity and microfoundation, and others, such as absorptive capacity and radical and incremental innovation. This interest led me to develop my knowledge about related literature and theory. From this, I enjoy identifying the literature gaps, developing a hypothesis, and going into the field.

## 3.2. Methodological Approach

Reflecting on my epistemological posture provides an excellent explanation of how methodological choices were made for this thesis. The following section describes the different methodologies used in the thesis chapters.

Regarding Chapter 1, there were various steps before crafting the article, including reading and summarizing the literature, online searches of keywords and articles, writing critical summaries of previous studies, and searching for published reviews to establish the preliminary state of the literature. Nine relevant sources were identified in top management journals that extensively cover various aspects of ambidexterity. Among these, two major reviews by Raisch and Birkinshaw (2008a) and Simsek (2009) were particularly influential in the field of ambidexterity. Besides the symposium (O'Reilly & Tushman, 2013) and introduction to a special issue (Tarba et al., 2020), the reviews have discussed mechanisms for effectively managing exploration and exploitation (Turner, Swart, & Maylor, 2013), the importance of ambidextrous leadership (Rosing, Frese, & Bausch, 2011), ambidexterity through a bibliometric review (Chakma, Paul, & Dhir, 2021), and how multinationals (Christofi et al., 2021) and SMEs (Mu, van Riel, & Schouteten, 2022) manage ambidexterity. By analyzing the diverse aspects of existing knowledge, the mentioned reviews have provided a more nuanced view of ambidexterity, with implications spanning multiple levels of analysis.

The methodology applied in this first chapter is a systematic literature review. And the particularity of this review is that it was started by an expert survey, like Wirtz et al.'s (2016) study. The expert survey was a short questionnaire sent to academic scholars who can be defined as ambidexterity experts. More details on the survey procedure are provided in Chapter 1's methodological section. This expert survey was used as a preliminary step to define the scope of the systematic search and interpret the results more thoroughly. The SLR following Tranfield et al. (2003) methodology offers a comprehensive overview of the current state of research on multilevel ambidexterity and sheds light on valuable avenues for future research. Fifty-nine multilevel articles about ambidexterity were selected from the selection process's various steps. Those selected articles were then read (in their entirety) at least four times and coded to identify pivotal patterns. The results are presented in Chapter 1.

Data collection for the primary data in Chapters 2 and 3 was far from straightforward, as it required substantial time to convince contacts and pugnacity to obtain sufficient data from farmers and agribusiness players respecting the constraints of the research designs. This experience fully supports that the reasons for the lack of multilevel studies "are that empirical microfoundational work requires data sampling on at least two levels, which is often difficult (costly), and, perhaps, that knowledge of relevant empirical methodology (i.e., multi-level statistics) is not yet sufficiently diffused in the research community" (N.J. Foss & Pedersen, 2016, p. 6). One related critical methodological aspect raised in the literature is developing empirical multilevel studies examining individual and collective ambidexterity simultaneously with appropriate measurement scales (Simsek, 2009b). Therefore, the ambidexterity measurement scales were strictly applied from the reliable scale found in the literature.

Regarding the empirical quantitative studies, we reflected on the time range of analysis since we may wonder what time range to select should the unit of analysis (e.g., network, alliance, organization, team, or individual) be considered ambidextrous. In this thesis, we measure individual exploration and exploitation activities by considering the previous year, following Mom et al. (2007, 2009), even though some others use shorter durations, such as the preceding month (Affum-Osei et al., 2020) and weekly and daily activities (Rosing & Zacher, 2017). Using the previous year's activity is the most common for assessing ambidexterity because this lengthier period enables respondents to evaluate their perception of balance, covering the contextual approach of ambidexterity.

Concerning Chapter 2, a survey-based multi-source research design was established. Data were collected in France from agribusiness players. Two surveys were developed. One comprises organizational-level questions attributed to the CEOs; the other comprises individual-level questions for employees. One hundred and seventy-three companies participated in the study by having their CEOs and at least one employee complete the two questionnaires. A total of 212 pairs were collected. Structural equation modeling (SEM) was employed for data analysis.

Concerning Chapter 3 and based on the two previous chapters, this study aims to go further in the analysis by integrating the interorganizational level of analysis. The research setting was based on companies considered as part of a network of businesses in the algae industry. Two questionnaires were also designed. But this time, the CEOs' questionnaire included

interorganizational and organizational questions, while the employees' questionnaire included individual-level questions. The objective was to cover as many companies that were part of the algae network and as many of their employees as possible. A total of 304 responses were collected from employees working in 32 companies, which implies that 32 CEOs participated in this study. SME was the statistical technique employed to analyze our data.

# 4. Empirics from Agribusiness

## 4.1. Motivation and Interest

Agribusiness is defined as this thesis's field of application. The agribusiness terminology combines agriculture and business and refers to any businesses related to agricultural production (Bairwa et al., 2014). According to Bairwa et al. (2014), the word agribusiness is used for "farming plus all the other industries and services that constitute the supply chain from farm through processing, wholesaling and retailing to the consumer" (p1). Underlying the empirics are various motivations and interests that trigger our choice to apply ambidexterity to this industry. Agribusiness immediately appeared as a meaningful sector of activity for at least three key reasons.

First, it is reasonable to argue that agriculture remains and will stay a pillar in our society at different scales: globally, nationally, and regionally. Agricultural activities are essential worldwide for food sovereignty. As mentioned within the UN's 17$^{th}$ goal of zero hunger (United Nations, 2015), agriculture-related activities are responsible for feeding people to reduce the food shortages many communities still face. The UN's World Food Program director has recently announced that the Covid-19 pandemic will likely worsen food insecurity in the next few years (WFP, 2020). Plus, the pandemic made us realize how much agriculture was a globally essential activity. Apart from during a crisis, agriculture is a sector highly impacted by environmental changes (Notarnicola et al., 2017), which is also a key industry for developing sustainability toward a triple-bottom-line model. Agriculture is intimately connected with its external environment, such as climate change, societal preferences, or political changes. Although natural consequences are often related to agricultural activities, it is (above all) a financially sustainable industry. The agri-food industry is the largest in France (in terms of employment and turnover) and drives the national economy (Draaf, 2018). The French territory has extremely varied agricultural production due to the diversity of its landscapes. As a native of the Brittany region, I know that agriculture represents a dominant activity. It is the first French region in terms of pig breeding. And other activities are predominant, such as milk production, above-ground breeding, and plant production for fodder (maize silage) or processing intended to feed animals. Hence, agriculture contributes to local dynamism. In particular, Brittany counts 26 335 farms, feeding 20 millions of people, with an annual turnover of €8.9 billion (Stoumboff, 2022). It is a vital industry for Brittany and France — and society.

And this long-lasting importance emphasizes the willingness to anchor my thesis in the agribusiness sector.

Second, agribusiness represents an impactful field for research as much as it is for our society. Making an impact has become a crucial concern and objective in research and other endeavors. But academic institutions, such as the Rennes School of Business and the University of Strasbourg - BETA laboratory, have developed external collaborations with other institutions specializing in agriculture like the National Research Institute for Agriculture, Food and the Environment (INRAE) or have internally created a specific axis of research (Agribusiness research center). The zeal for anchoring management research in this activity sector comes from an empirical need from the literature and practical needs emerging from the players working in the agribusiness industry. Most empirical studies in the ambidexterity literature are conducted in industrial sectors characterized by information technology, biotechnology, automobile, public sectors, and service-oriented businesses. Based on Pertusa-Ortega et al.'s (2020) findings, we argue that research publications on ambidexterity are scarce in industries with relatively low innovation intensity. Agriculture has rarely been studied in multilevel ambidexterity research. And this could be explained by the critical point of accessing data in sufficient quantity, which was the main challenge of the empirical projects. But it is worth overcoming these difficulties because the agriculture industry is essential for our food sovereignty, as we noticed during the covid pandemic. It is also a sector transforming toward more sustainable production. Sustainability can emerge from innovation, new technologies, or rediscovering ancient practices.

Third, agriculture represents a field of more personal interest. As a researcher, I express a sensibility toward the challenges farmers face. The dilemmas they face relate to my research interest, such as making their operations more modern and efficient while sufficiently increasing their margin to make a living. Relatively low incomes are reported in the agriculture industry. While cereal producers make 980 euros per month, cattle breeders make 1100 euros. As a source of comparison, the average salary in France is 2520 euros (INSEE). New dilemmas are emerging: deciding whether to mitigate or adapt to climate change, use a patch of land for agriculture or produce renewable energies, or go digital or remain traditional. Anticipating the future is more important than ever to ensure the sustainability of their activities. For instance, farmers must consider and plan the succession of their activities because the retirement of farmers currently represents a national issue. The current challenges have reinforced my

willingness to get involved in applying my research thesis to agricultural activity. It is also a field of application that I find especially concrete (and perhaps more traditional), more down to earth than research activity in academia. Being in touch with industry players brings us back to simple things that balance well with the intellectual complexity of research. It is a promising sector for making a substantial impact on society.

## 4.2. Managerial Objectives

Impacting society through academic research in agribusiness requires coherence between the theory and field of study. The research fit is explained in this section and flows toward the managerial objectives this research aims to achieve.

Ambidexterity is associated with the exploration and exploitation paradox but must be relevant for agribusiness workers. Generally, regardless of the levels of analysis, we see that innovation is increasingly crucial for farmers. They must diversify and actively seek new customer segments to mitigate their risk. But exploitation has always been a vital source of competitive advantage for producers, growers, and breeders who optimize their resources to get the maximum yield. Ambidexterity debates can be expanded to industry-specific contradictions, such as providing quality food while generating sufficient volume to meet the company's development ambitions. Exploration in agribusiness can be made more specific (for example, by associating it with the environmental transition and climate change). Studying ambidexterity in agribusiness raises the primary objective of providing insights to the players about ambidextrous management that may benefit their TBL performance.

Agribusiness is an industry with a predominant number of small- and medium-sized enterprises (SMEs), most likely due to the diluted characteristic of the industry having many players, farmers, intermediaries, distributors, food processors, etc. The TBL is a substantial concern discussed by and for multinationals, and it becomes relevant for SMEs. This research studies SMEs to complement the existing managerial implications relying on another field. For example, Christofi et al. (2021) reviewed 26 studies focused exclusively on multinationals and the microfoundation of ambidexterity. SMEs represent a research gap in the multilevel ambidexterity literature since only three studies have investigated this topic (Ajayi et al., 2017; Kiss et al., 2020; Venugopal et al., 2020). The managerial objective is to place greater emphasis on investigating SMEs (as ambidexterity is essential for their short-term survival and long-term

prosperity) and reveal ambidexterity’s impact on SMEs' Triple Bottom Line (TBL), especially within the agricultural field of study.

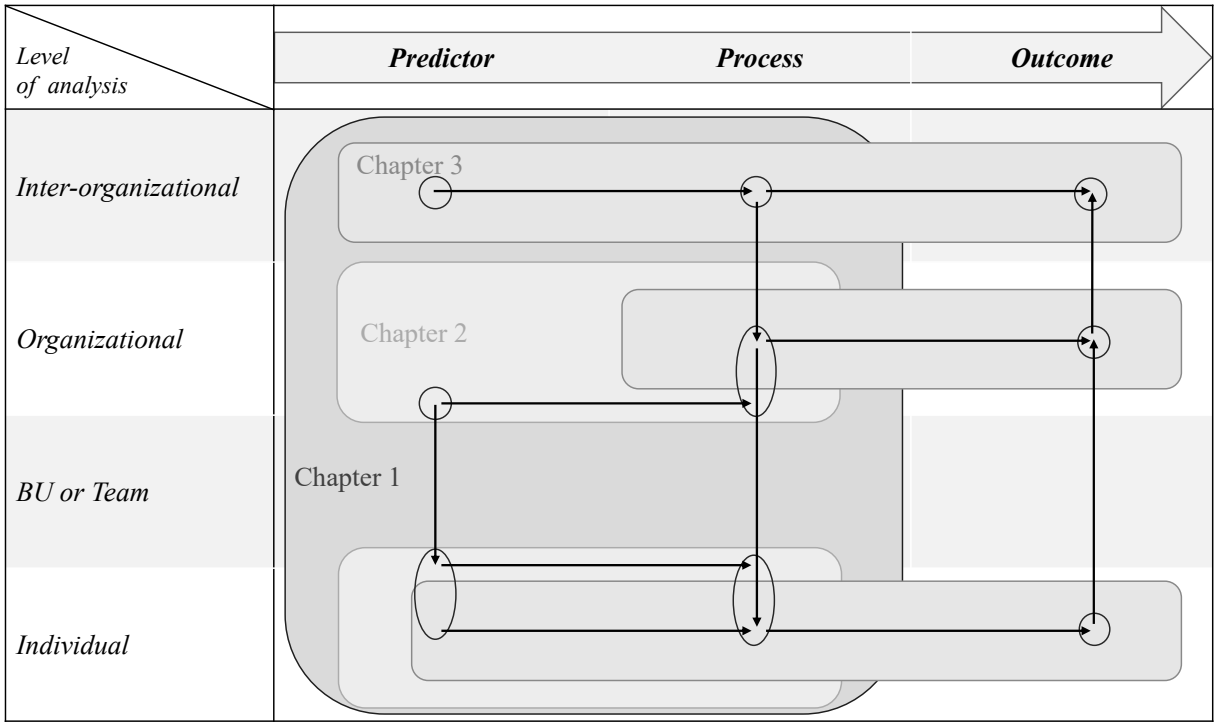
# 5. Overview of the thesis chapters

## 5.1. Scope of the thesis

This dissertation's scope encompasses all the subjects covered in the following chapters. Its primary focus is exploring multilevel ambidexterity's antecedents and outcomes. In considering four organizational levels: inter-organizational, organizational, BU or team, and individual, Figure 1 presents the coverage of the thesis chapters. These levels of analysis have been reviewed by the literature. However, it is noteworthy that in the empirical studies, BU or team-level ambidexterity was not covered because most of the companies studied were SMEs.

Regarding ambidexterity's antecedents and outcomes, several factors have been examined across different organizational levels. However, it is crucial to acknowledge that not all of these factors could be thoroughly studied within this thesis's scope. And neither comparison of their relative importance could be conducted. For instance, it does not cover employees' performance in terms of productivity or skill growth.

Figure 1 : Thesis chapters in nested organizational levels



## 5.2. Outline of the chapters

This dissertation consists of three chapters (see Table 1) that explore the previously mentioned sub-research questions. The chapters are structured coherently following the chronological order the Ph.D. work has followed and the progression of intellectual reflection. Following a deductive approach, this dissertation is based on theory as the foundation from which hypotheses have been developed. Each chapter is a study that provides valuable insights into recent developments and ongoing discussions in the literature.

Chapter 1 examines the research question of what we know—and do not know—about ambidexterity from a multilevel perspective. This chapter, a comprehensive literature review, considers all types of organizational levels. This first chapter reviews the published articles that have thoroughly investigated multilevel ambidexterity. It starts by explaining the relevance of multilevel ambidexterity and then examines what we know and don't know about this topic. Based on the research gaps highlighted by the literature, it offers a rich research agenda for orienting future research. This systematic literature review is focused mainly on the antecedents and different approaches of ambidexterity, which lead to the development of a conceptual framework synthesizing our knowledge about multilevel ambidexterity.

Chapter 2 examines the research question of the role of organizational empowerment climate in multilevel organizational and individual ambidexterity in agribusiness. This chapter presents a quantitative article on organizational and individual-level ambidexterity in agribusiness. This study's motivation comes from human interactions. And more precisely, we seek to understand the role of an empowerment climate in multilevel ambidexterity. The findings obtained through structural equation modeling reveal the significant role of an organizational empowerment climate, fully mediating the relationship between individuals' knowledge inflows and individual ambidexterity and the relationships between connectedness and organizational ambidexterity. By integrating the main result into the existing literature, this article aims to contribute to the multilevel ambidexterity body of knowledge, the literature on the empowerment climate, and managers facing tensions in the agribusiness sector.

Chapter 3 examines the research question of how multilevel — employee, company, and interorganizational — ambidexterity intertwined contributes to economic, environmental, and social performance. This chapter explores multilevel ambidexterity's outcomes, specifically

integrating environmental and social performance aspects of typical economic performance. The multilevel perspective is visible through analyzing interorganizational, organizational, and individual-level variables. Interestingly, our data diverges from past research, as it does not support a direct relationship between organizational ambidexterity and company economic performance but demonstrates a positive relationship with environmental performance. By adopting a microfoundational approach, this article analyses the interlevel relationships using the metaphor of the double-bathtub model (where the higher one is supported, and the lower one is not). Beyond enriching the existing literature, significant managerial contributions are provided to help virtuous multi-stakeholder networks transition toward greater sustainability and improved environmental performance.

Upon concluding, this dissertation discusses the contributions made by the three chapters to the ongoing debates in the field of ambidexterity. It also explores this research's theoretical and managerial implications while acknowledging its limitations. The conclusions drawn from this study primarily apply to small and medium-sized companies in France's agribusiness sector. Further investigations are required to extend these findings to large firms, multinationals, and global enterprises operating in various sectors.

Table 1 : Overview of the thesis chapters

| | | Thesis Title<br>**Ambidexterity Across Organizational Levels — A Study of its Multilevel Antecedents and Outcomes** | | |
|---|---|---|---|---|
| Study no., Chapter no. | | **Study #1** — Chapter 1 | **Study #2** — Chapter 2 | **Study #3** – Chapter 3 |
| **Description** | Title | Which Studies Have Thoroughly Investigated Multilevel Ambidexterity? An Expert Survey, an SLR, and Future Research Paths | An Empowerment Climate's Central Role in Individual and Organizational Ambidexterity —<br>Evidence from Agribusiness | Stronger Together: The Effect of Individual Ambidexterity on Inter-Organizational Environmental Performance |
| | Authors | Loquen, M., Scaringella, L., & Burger-Helmchen, T. | Loquen, M. & Scaringella, L. | Loquen, M. |
| | Research questions | What do we know—and not know—about ambidexterity from a multilevel perspective? | What is the role of organizational empowerment climate in multilevel organizational and individual ambidexterity in agribusiness? | How do multilevel — employee, company, and interorganizational — ambidexterity intertwined contribute to economic, environmental, and social performance? |
| | Keywords | Ambidexterity, multilevel, expert survey, systematic literature review | Ambidexterity, multilevel, innovation, empowerment climate, agribusiness | Ambidexterity; multilevel; microfoundation; the triple bottom line; agribusiness |
| | Paper trajectory | Presented at EURAM 2022 conference, Winterthur (Switzerland)<br>Presented at AIMS 2023 conference, Strasbourg (France) | Presented at the Rennes School of Business 2023 Ph.D. workshop | |

# CHAPTER 1

## Which studies have thoroughly investigated multilevel ambidexterity? An expert survey, an SLR, and future research paths

## Abstract

Ambidexterity is an organization's ability, embedded in multiple organizational or interorganizational levels, to balance exploration and exploitation. To better understand organizational ambidexterity, this study focuses on multilevel ambidexterity through two means. The first is a survey comprising 36 international experts to better understand the current and future research on multilevel ambidexterity. Using the experts' insightful guidance, in a second part, a systematic literature review was conducted on multilevel ambidexterity studies. Fifty-nine peer-reviewed articles were analyzed from three databases: Web of Science, Scopus, and EBSCO. In multilevel investigations involving various methodological stances, measurements, antecedents, and ambidexterity types, our findings reveal theoretical anchoring, varied study contexts, and a number of patterns. This comprehensive review of ambidexterity contributes to the literature by proposing a multilevel and multiapproach framework that conceptualizes ambidexterity's antecedents. Its contributions complement the current literature on ambidexterity and multilevel approaches by focusing on the existing knowledge concerning ambidexterity as a nested phenomenon. Finally, our article presents precise avenues for further research on ambidexterity concerning theoretical foundations, operationalization of the constructs, specific analysis levels, interactions between different levels of analysis, and empirical contexts.

**Keywords:** ambidexterity, multilevel, expert survey, systematic literature review

# 1. Introduction

In recent years, the academic community has become significantly interested in organizational ambidexterity, especially because ambidextrous organizations tend to outperform others in growth and survival (Andriopoulos & Lewis, 2009). Following Duncan (1976) and March (1991), recent literature has defined organizational ambidexterity as a firm's ability to balance exploitation and exploration, which are contradictory but complementary activities. Organizational ambidexterity comprises engaging in exploitative activities (which enhance depth of knowledge and capabilities) while also engaging in explorative activities (which enlarge the scope of knowledge and capabilities) (Junni, Sarala, Taras, & Tarba, 2013; Tushman & O'Reilly, 1996).

Scholars started investigating different analysis levels to develop ambidexterity through multiple organizational layers, including lower levels of organizational ambidexterity, also known as microfoundations (Balarezo & Nielsen, 2022), such as business unit (Birkinshaw & Gibson, 2004), group and team (Jansen, Kostopoulos, Mihalache, & Papalexandris, 2016), and individual levels (Keller & Weibler, 2015). March (1991) indicated "finding an appropriate balance is made particularly difficult by the fact that the same issues occur at levels of nested systems—at the individual, organizational, and social system levels" (p. 72). Such a multilevel research strategy is necessary because of the complex nature of organizational ambidexterity and the need to coordinate collective actions across hierarchical levels (Tarba, Jansen, Mom, Raisch, & Lawton, 2020). Therefore, we argue this multilevel complexity should be studied further to understand and develop knowledge on ambidexterity.

Raisch and Birkinshaw (2008a) supported multilevel research as beneficial to understanding the organizational paradigm nested in different management systems. More precisely, multilevel thinking is based on how corporate entities comprise nested arrangements (Hitt, Beamish, Jackson, & Mathieu, 2007). Hitt et al. (2007) highlighted single-level studies on ambidexterity might substantially limit full understanding of the subject by undervaluing cross-level interaction and overgeneralizing the effect of antecedents nested in one level (Rousseau, 1985). Therefore, one must develop a more thorough understanding of ambidexterity from the multilevel perspective to capture the nested arrangements within organizations. Raisch and Birkinshaw's (2008a) and

Simsek's (2009) work has significantly increased the focus on multilevel studies by considering ambidexterity as a cross-level infused capability inside an organization. Although the literature has extensively explored ambidexterity antecedents and outcomes from multiple approaches, knowledge about ambidexterity's precursors remains sparse across analysis levels. Thus, this present study conducts a systematic literature review (SLR) on multilevel ambidexterity.

Simsek (2009) attempted to understand ambidexterity using individual and organizational units of analysis. Afterwards, many empirical papers developed multilevel frameworks, such as a framework of ambidexterity's virtuous cycles (Andriopoulos & Lewis, 2009), a context-conduct-performance framework (Lavie, Stettner, & Tushman, 2010), and an ambidextrous charter process (Zimmermann, Raisch, & Birkinshaw, 2015). More specifically, Zimmermann et al. (2015) made early attempts to study the role of individuals in ambidextrous strategic alliances. More recently, scholars like Harris and Wood (2020) and Mom, Chang, Cholakov, and Jansen (2019) used dual-level analysis at the organizational and individual levels, inspiring Christofi, Vrontis, and Cadogan (2021) in their study using team and individual levels. Their findings suggest ambidexterity can be managed across different organizational levels.

We found seven review papers, one symposium (O'Reilly & Tushman, 2013), and one introduction to a special issue (Tarba et al., 2020) published in top management journals on specific aspects of ambidexterity. The scientific community have considered Raisch and Birkinshaw's (2008a) and Simsek's (2009) reviews as pivotal milestones for ambidexterity. Some key topics emerged from the reviews on ambidexterity, including mechanisms for managing exploration and exploitation (Turner, Swart, & Maylor, 2013), ambidextrous leadership (Rosing, Frese, & Bausch, 2011), ambidexterity in multinational enterprises (Christofi et al., 2021), individual ambidexterity in SMEs (Mu, van Riel, & Schouteten, 2022), and organizational ambidexterity through a bibliometric review (Chakma, Paul, & Dhir, 2021). Those reviews have added a nuance to the understanding of ambidexterity and provided insights into its multilevel implications. For example, Turner et al. (2013) reviewed the mechanisms related to intellectual capital enabling ambidexterity across organizational levels (organization, group, and individual) and Christofi et al. (2021) used a micro-foundational lens to review multinational enterprises' organizational ambidexterity.

Although some literature reviews on ambidexterity have included elements of its multilevel nature, none has made multilevel ambidexterity studies its focus. However, several authors have agreed ambidexterity's antecedents are interrelated because ambidexterity is a nested phenomenon and, thus, cannot be fully understood when analyzed separately using a single analysis level (Chandrasekaran, Linderman, & Schroeder, 2012; Christofi et al., 2021; Stadler, Rajwani, & Karaba, 2014). Because of ambidexterity's multilevel nature and the lack of review papers on ambidexterity's precursors using a multiple-units-of-analysis perspective, we investigate the state of ambidexterity literature using more than one analysis level. We argue a theoretical and empirical gap exists in studying multilevel ambidexterity at the related interactions between individual, group, organizational, and interfirm levels of units of analysis. In this context, an SLR is appropriate to provide a comprehensive overview of the current development of the literature on multilevel ambidexterity and provide insightful directions for future research. For those reasons, this study addresses the following research question: What do we know—and not know—about ambidexterity from a multilevel perspective?

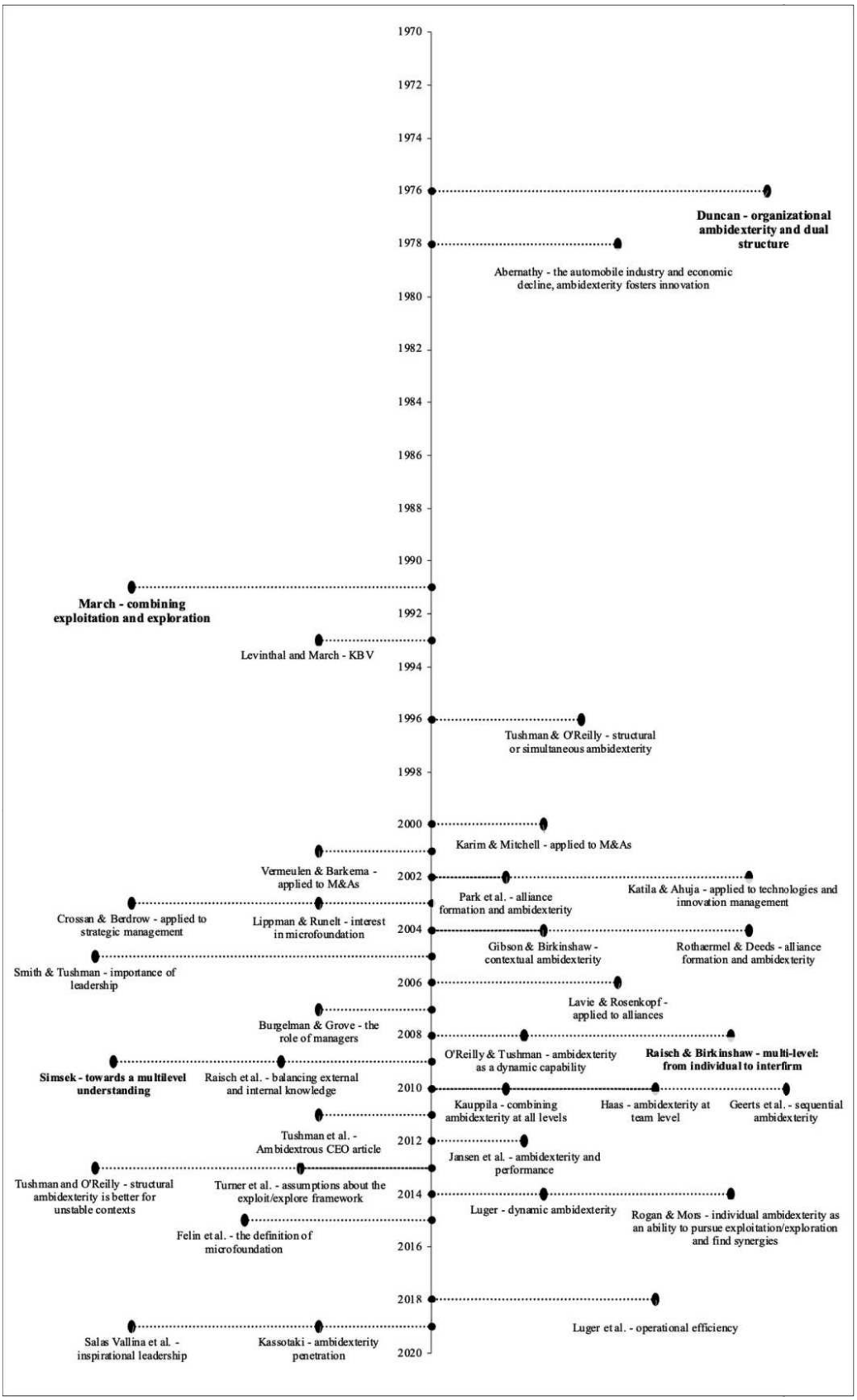
Our article is divided into four parts to answer this research question. First, we provide a theoretical perspective of ambidexterity and its analysis levels. Second, we present our review's research method, including an expert survey completed by 36 scholars, to collect preliminary insights that helped establish relevant research avenues. Third, using an SLR, we synthesize the insights from 59 articles to provide the state of knowledge on ambidexterity; this considers their methodology, research settings, and analysis levels. Fourth, based on our expert survey and SLR, our study suggests meaningful avenues for additional research on ambidexterity and its complex interactions across different units of analysis. This multilevel SLR is comprehensive and integrates interdisciplinary knowledge from different theoretical backgrounds. Therefore, our SLR contributes to the ambidexterity literature following Raisch and Birkinshaw (2008a), who called for multilevel studies.

# 2. Theoretical background

## 2.1. Overview of ambidexterity's emergence

Duncan and March are two early inspirational ambidexterity scholars. First, Duncan (1976) defined ambidextrous organizations as those with designs favoring innovation, which was thanks to adapted structures and processes enabling them to deal with potential conflicts emerging during the innovation process. Second, March (1991) defined exploration as activities related to innovation, searching, risk taking, experimenting and characterized exploitation as behaviors concerning refinement, efficiency, execution, and implementation. Balancing exploration and exploitation leads to firms' survival and prosperity (March, 1991). A great deal of complementarity exists between those two seminal papers: Duncan's does not explicitly discuss exploration and exploitation, but March's does mention ambidexterity. The ambidexterity literature has undergone critical milestones since then, depicted in the timeline in Figure 2, in which we observe an increasing number of publications using different levels of analysis.

Figure 2: Timeline of pivotal ambidexterity studies



The literature commonly identifies the analysis level to specify the lens used to examine integrated relationships. An analysis level is strongly related to the research context and the analysis framework (Hitt et al., 2007), and an analysis level differs slightly from the unit of analysis and unit of observation, both of which refer to the nature of the data collected. Researchers may focus only on one analysis level. This does not mean the study is incorrect, but it may be incomplete because whatever analytical choice is made, the levels of analysis are interconnected (Hitt et al., 2007). Based on the current body of knowledge in social sciences related to ambidexterity, we acknowledge studies using five levels of analysis: (a) individual, (b) team/group, (c) business unit, (d) organizational, and (e) interorganizational.

## 2.2. Individual-level ambidexterity

Bledow, Frese, Anderson, Erez, and Farr (2009) defined individual ambidexterity as "a person's ability to execute conflicting activities and be able to change between different mindsets and action sets" (p. 322). Following this line of thought, Tempelaar and Rosenkranz (2019) added, individual ambidexterity is the individual capability to practice exploitation and exploration activities and identify synergies between them (Mom, van Den Bosch, & Volberda, 2009; Rogan & Mors, 2014). Furthermore, individual ambidexterity may also be considered an individual's ability to be involved in opposite functions ( Bledow et al., 2009; Miron-Spektor, Gino, & Argote, 2011; Smith & Tushman, 2005).

Following previous studies, individual ambidexterity is a multidimensional construct referring to how much individuals perform explorative and exploitative activities on a daily basis (Bledow et al., 2009; Mom et al., 2009). Exploitation encompasses actions extending existing assets, skills, and knowledge, and exploration comprises those actions needed to obtain broader knowledge and develop new opportunities (Benner & Tushman, 2003; Gupta, Smith, & Shalley, 2006; Jansen, George, van den Bosch, & Volberda, 2008). Therefore, ambidexterity research analyzes people's daily operations and how they organize their time to meet their short-term and long-term objectives. On that point, Breslin, Romano, and Percival (2016) argued when individuals perform tasks such as engineering planning, individuals from the engineering team can choose to execute

them collectively following a standard planning mode of operation, or they can opt to perform a planning schedule only they use.

Ambidextrous individuals must deal with several challenges related to combining conflicting tasks. Gupta et al. (2006) mentioned "it would be difficult for an individual to develop routines to excel simultaneously at both exploration and exploitation... [or] to even switch between routines of exploration and exploitation" (p. 19). Similarly, Taylor and Helfat (2009) highlighted individual ambidexterity demands effectively integrating knowledge responding to exploratory and exploitative business requirements. The individuals they refer to must have sharply opposite values, contextual knowledge, and behavioral expectations that reflect the opposing demands of exploration and exploitation (Leavitt, Reynolds, Barnes, Schilpzand, & Hannah, 2012; Mom et al., 2009). Past studies have analyzed an individual's capacity to perform opposing tasks, but they have failed to explain why some individuals can do them while others cannot (Raisch, Birkinshaw, Probst, & Tushman, 2009).

The focus on ambidexterity at the organizational level has failed to include analyzing how employees deal with opposing demands and incorporate exploration and exploitation activities. For this reason, recent studies have emphasized the importance of understanding collective issues like organizational ambidexterity by only considering the individual level. According to Gibson and Birkinshaw (2004), ambidexterity demands the motivation and participation of ambidextrous employees. Felin and Foss (2005) further argued, "organizations are made up of individuals, and there is no organization without individuals. There is nothing quite as elementary; yet this elementary truth seems to have been lost in the increasing focus on structure, routines, capabilities, culture, institutions, and various other collective conceptualizations in much of the recent strategic organization research" (p. 441). Therefore, ambidexterity may be visible at the organizational macro-level and the individual level (Raisch et al., 2009; Turner et al., 2013). Furthermore, in line with Breslin et al. (2016), we suggest individuals' actions can affect their team's activity pattern by convincing others the individuals' new individual routine should be adopted as a collective new standard.

## 2.3. Team/group level ambidexterity

At the team/group level, one must allocate resources between short-term and long-term activities. For instance, some group members can focus more on exploration activities while others focus on those related to exploitation. Past research has indicated high-technology firms depend solely on teams to balance exploration and exploitation within invention teams and apply existing and recent knowledge to develop new technologies (Jansen et al., 2016; Tushman, Smith, Wood, Westerman, & O'Reilly, 2010).

P. Wang, Van De Vrande, and Jansen (2017) built on the framework of exploration and exploitation by examining the antecedents and implications of inventions that balance existing and recent knowledge within teams. P. Wang et al. (2017) tested their hypotheses on team structure and invention quality using a sample of semiconductor firms' patents. In a sample size of over 36,000 inventions, 4.7% of the better-quality inventions were discovered to be balanced inventions rather than over-exploratory or over-exploitative ones. They analyzed the inventions' quality at various exploration levels using semiconductor industry patent data. P. Wang et al.'s (2017) findings show scant knowledge exists regarding how a team's structure balances exploration and exploitation within inventions, even though the inventing team is the brains behind inventions (Wuchty, Jones, & Uzzi, 2007). Nonetheless, other studies have argued a team's structure may influence the output it achieves (Gruber, Harhoff, & Hoisl, 2013; Singh, 2008).

Following P. Wang et al.'s (2017) findings, firms must structure their invention teams to balance exploration and exploitation. The emphasis should thus center on how the invention team structure can be understood by the level of exploration within an invention or the probability of developing a balanced invention. Recent studies have focused mostly on higher hierarchy teams for exploration and exploitation (Beckman, 2006; Lubatkin, Simsek, Ling, & Veiga, 2006), but teams leading the way in new inventions have received scant attention. P. Wang et al.'s (2017) research has provided evidence on how team structure can affect balancing inventions. Specifically, P. Wang et al. (2017) examined how a team's tendency to balance exploration and exploitation within inventions is influenced by the invention team's size and experience (general and specific), which are critical elements of the invention team's structure. In large companies, an intermediary level exists between

a group and its organization, and the role played by business units appears meaningful in the studies on ambidexterity.

## 2.4. Business-unit–level ambidexterity

At the business-unit (BU) level, past studies have raised a debate about the nature of conflicting demands and ambidexterity types and their relative effects on performance. BU-level studies have used ambidexterity as a lens to study BU-level conflicts between exploration and exploitation (Hill & Birkinshaw, 2014; Raisch & Birkinshaw, 2008a), alignment and adaptability in business units (Ghoshal & Bartlett, 1994; Gibson & Birkinshaw, 2004), and proactiveness and responsiveness (Herhausen, 2015).

Ambidexterity can be achieved in several ways, including structural separation. To achieve ambidexterity, Duncan (1976) initially recommended a dual-structured organization with a distinct focus, meaning at the BU or corporate level, a distinction exists between BUs dedicated to exploitation and exploration core activities (Raisch & Birkinshaw, 2008a). Within firms' corporate strategies, the structural separation of activities in several business units led to organizational ambidexterity. Despite this well-known initial form of business-level ambidexterity, a strong interest in contextual ambidexterity emerged. According to Ghoshal and Bartlett (1994), ambidexterity can be achieved at the BU level differently by considering the environmental and firm context as vital decisive factors rather than using a structural distinction between exploitation and exploration (i.e., when leaders successfully use processes and systems). This way, BUs' performances rely not only on leadership, formal organization structure, or informal mechanisms but also on context to achieve alignment and adaptability simultaneously (Ghoshal & Bartlett, 1994). Gibson and Birkinshaw (2004) also advocated that alignment and adaptability can be attained simultaneously at the BU level, which is contextual ambidexterity. This contextual ambidextrous ability is based on trust, discipline, stretch, and support (Gibson & Birkinshaw, 2004). Hill and Birkinshaw (2014) challenged the duality between exploration and exploitation and highlighted the risk of an either/or strategy. If a business unit focuses exclusively on exploitation, it risks being subsumed by the parent company. But if it focuses only on exploration,

it risks being extracted as a spin-off. However, the simultaneous mix of exploitation and exploration favors BU survival (Hill & Birkinshaw, 2014). Following the debate on ways to balance conflicting demands, Foss and Kirkegaard (2020) defined blended ambidexterity as an ambidextrous ability expressed under several different modes: structural, contextual, or/and temporal, which they argued are not mutually exclusive. Chen and Kannan-Narasimhan (2015) studied formal integration mechanisms between business units to achieve ambidexterity, and their results fill the gap between temporal and structural forms of ambidextrous structures, revealing integration mechanisms.

Regarding ambidexterity's effect on performance, Herhausen (2015) found balancing proactiveness and responsiveness market orientation at the BU level does not always lead to better performance—chiefly when the balance is achieved at low levels. Before reaching a threshold that will lead to a competitive advantage, increasing the level of ambidexterity is a cost and anticipation of failure (Herhausen, 2015). Lin, McDonough, Lin, and Lin (2013) contributed to the debate of achieving simultaneous or sequential ambidexterity at the BU level by outlining that simultaneously working on incremental and radical innovation leads to superior performance. They found a high level of exploitation and exploration is better than balancing the two activities, and simultaneous ambidexterity is better than sequential ambidexterity (Lin et al., 2013).

## 2.5. Organizational-level ambidexterity

Some studies have investigated how an organization can achieve short-term and long-term outcomes at the organizational level. Most ambidexterity research is based on a macro-level perspective, which has provided solid bases for understanding the procedures, structures, and methods that enhance the firm-level capacity to explore and exploit knowledge simultaneously. Organizational ambidexterity is critical for establishing a competitive advantage over time (He & Wong, 2004; O'Reilly & Tushman, 2013), which has led to increased interest in studying it and has also focused on the trends, determinants, and effects of ambidexterity in organizations (O'Reilly & Tushman, 2013) along with the various hierarchical firm structures affecting

organizational ambidexterity (Beckman, 2006; Jansen, Simsek, & Cao, 2012; S. Lee & Meyer-Doyle, 2017; Phelps, 2010; Uotila, Maula, Keil, & Zahra, 2009).

Researchers have employed various theoretical perspectives to study organizational ambidexterity, including corporate learning literature (March, 1991), innovation studies (Jansen, van den Bosch, & Volberda, 2006; Smith & Tushman, 2005), strategic management (Stettner & Lavie, 2014), organizational design (Tushman & O'Reilly, 1996), entrepreneurship (Koryak, Lockett, Hayton, Nicolaou, & Mole, 2018), and organizational adaptation (Gupta et al., 2006). This variety of theories applied to organizational ambidexterity results in proposing numerous relationships between variables with the roles of antecedents, moderators, mediators, and outcomes. This has increased academic researchers' interest in ambidexterity's precursors and predictors and has expanded knowledge about ambidexterity along different lines of thought. For instance, Kraatz (1998) argued a firm's motivation to imitate fosters its exploratory behavior. More complex studies used several levels, such as Tarba et al.'s (2020) conceptual paper, which showed a quadripartite approach materialized by a 2x2 matrix: on one side, the individual or collective level, where the phenomenon is visible; on the other, the level where an organization or individual can experience the effects.

Three main approaches, structural, contextual, and temporal ambidexterity, have been used to study organizational ambidexterity (Gibson & Birkinshaw, 2004). Structural ambidexterity implies the separation of exploration and exploitation activities across distinctive business units or departments (Raisch & Birkinshaw, 2008b; Simsek, 2009). In this view, a firm is divided into units, which can be dedicated to high levels of exploration or exploitation. These units need not be physically separated, but their expertise, competencies, culture, and process differ (Benner & Tushman, 2003). In such a configuration, services like accounting and production are related to exploitative activities, and R&D and marketing are related to explorative activities. Compared to structural ambidexterity, contextual ambidexterity relies on a certain freedom to explore or exploit, which depends on contextual demands. According to the contextual approach of ambidexterity, firms can simultaneously achieve exploration and exploitation across the business units (Gibson & Birkinshaw, 2004). Finally, temporal ambidexterity is a dynamic view based on shifts between exploration and exploitation periods. Nickerson and Zenger (2002) and Siggelkow and Levinthal

(2003) have studied temporary cycles, which allow firms to switch between exploration and exploitation. We should be mindful there is a limitation to studying ambidexterity on an organizational level in which it is isolated from the employee's influence and independently from its partners or competitors: organizations do not operate alone, and their interaction with partners can help them be more ambidextrous.

## 2.6. Interorganizational level ambidexterity

Interorganizational ambidexterity can be defined as balancing conflicting strategic goals (Wassmer, Li, & Madhok, 2017). At an interorganizational level, research has focused on mobilizing the external stakeholders that contribute to firms' capabilities to achieve short-term and long-term objectives. More recently, Duysters, Lavie, Sabidussi, and Stettner (2019) contributed to the literature by explaining ambidexterity antecedents through firms' interdependence in the electronics sector and argued a firm's exploration level was limited if only considering the firm as an independent player.

However how to manage ambidexterity at the interorganizational level remains understudied compared to other levels. Previous studies investigated ambidexterity between two partner firms at different levels of analysis, such as intraorganizational ambidexterity (Gibson & Birkinshaw, 2004) and interorganizational ambidexterity (Lavie & Rosenkopf, 2006). For instance, Lavie and Rosenkopf (2006) studied 19,928 alliance formations made between 1985 and 2001, and Zimmermann et al. (2015) focused on the long-term management of ambidexterity between two partners to understand how ambidexterity can emerge and last within alliances.

Other researchers, such as Duysters et al. (2019), focused only on exploration's precursors and found the effect of partner exploration on a firm exploration is stronger than the effect of one of its competitors. If the focal firm has a low level of exploration, when its partner increases its exploration level, that level will increase for the focal firm. This convergence is motivated by imitation and legitimation; divergence in the exploration level between two partners comes from perceived risks and uncertainties. Therefore, the exploration level of partners or competitors results in convergence or divergence (Duysters et al., 2019).

## 2.7. Existing review papers on ambidexterity

Most papers on ambidexterity employ one or several of five levels of analysis (individual, team/group, business unit, organizational, and interorganizational). For this study, we performed a preliminary Web of Science search on the existing ambidexterity review papers published in top management journals (The Chartered Association of Business Schools ≥ 3) and considered nine of them: seven reviews on ambidexterity, one symposium paper, and one introduction to a special issue. Table 2 provides an overview of the nine existing reviews on ambidexterity. This search for review articles on ambidexterity indicates a deepening of the knowledge of organizational ambidexterity.

Table 2 : Overview of the Existing Reviews on Ambidexterity

| Reference | Research focus | Research scope | Outputs |
|---|---|---|---|
| Raisch & Birkinshaw 2008a | Organizational ambidexterity | 20 articles from top management outlets (1991–2007) | Comprehensive framework including organizational ambidexterity's antecedents, moderators, environmental influencing factors, and performance outcomes |
| Simsek 2009 | Organizational ambidexterity review and attempt towards a multilevel understanding | 20 articles | Model of organizational ambidexterity with a multilevel lens; Each level is discussed separately, with propositions of moderating effects |
| Rosing et al. 2011 | Ambidextrous leadership | 77 articles on leadership and innovation | Categorization of opening and closing leadership behaviors. |
| Turner et al. 2013 | Management of ambidexterity | 85 articles on ambidexterity | Categorization of ambidexterity mechanisms according to their intellectual capital resources and levels of analysis. |
| O'Reilly & Tushman 2013 | SYMPOSIUM on organizational ambidexterity | Literature on organizational ambidexterity | Paths for future research |
| Tarba et al. 2020 | Microfoundations of ambidexterity/Special Issue introduction | Articles of the LRP special issue | A quadripartite matrix on the microfoundations of ambidexterity research and research agenda |
| Christofi et al. 2021 | Ambidexterity in MNEs | 26 articles on multinationals | Multidimensional and multidisciplinary framework |
| Chakma et al. 2021 | Review and research agenda | Organizational ambidexterity (2001–2020) | TCCM (Theories, Contexts, Characteristics, and Methodology) and five propositions |
| Mu et al. 2022 | Individual ambidexterity in SMEs | 65 articles on individual ambidexterity (2007–2019) | Two by two typology |
| *Our review* | *All organizational levels together: individual, team, business units, organizational, and interorganizational* | *59 studies on multilevel ambidexterity* | *Multilevel framework from multilevel studies* |

We also acknowledge three papers that have investigated ambidexterity's multilevel complexity (e.g., Simsek, 2009; Tarba et al., 2020; Turner et al., 2013). First, Simsek (2009) modeled the organizational and interfirm level antecedents of organizational ambidexterity. Second, Turner et al. (2013) focused on the relationship between ambidexterity and intellectual capital. Third, Tarba et al. (2020) considered ambidexterity a multilevel mechanism and provided a more thorough understanding of the microfoundation of ambidexterity at the individual level. Rosing et al. (2011) did not focus on the analysis levels used in the selected studies; however, they suggested multilevel research as one path for further research on leadership.

However, those three review papers from a multilevel perspective had some limitations. They did not focus exclusively on the multilevel mechanism; they considered all papers in their scope, including a single-level or multilevel use, which prevented them from drawing a clear path for further research on multilevel ambidexterity. Based on this preliminary search, we argue, to our knowledge, no previous reviews have covered how ambidexterity is studied from a multilevel perspective (i.e., using a multilevel theory or multilevel empirical design). Thus, more research is needed to explain organizational ambidexterity using a multilevel approach.

## 2.8. Multilevel perspective

The literature on the multilevel phenomena is expanding (Hitt et al., 2007; Simsek, 2009); therefore, it is worth clarifying. Specifying the analysis level at which each mechanism occurs increases the accuracy of social sciences knowledge. That multilevel articles consider two or more levels of analysis implies a multilevel nesting among the levels. It also suggests organizational ambidexterity emerges from the lower level of ambidexterity and the interfirm environment. On that point, Raisch and Birkinshaw (2008a) argued, "We would like to accentuate the need for studies spanning multiple levels of analysis…. Multilevel concepts and measures may be required to fully capture a firm's exploitation and exploration activities" (p. 397).

This call for more studies remains meaningful a decade later. García-Granero, Fernández-Mesa, Jansen, and Vega-Jurado (2018) highlighted the necessity for additional studies on the interconnected multilevel interdependencies among individuals, groups, and organizations in

acquiring and maintaining ambidexterity over time. Other studies, like Pertusa-Ortega, Molina-Azorín, Tarí, Pereira-Moliner, and López-Gamero's (2020), have also considered the multilevel analysis of ambidexterity and argued organizational and individual levels should be combined with teams and groups to investigate the relationships between micro and macro variables.

A multilevel perspective requires mobilizing several fields of study. For example, to study the individual level, existing studies refer to human resources management and psychology, and organizational and interorganizational studies turn to strategic management. The higher the macro-level considered, the more strategic it is and the lower the micro-level, the more operational. So, multilevel articles must consider several fields of study to embrace multiple levels.

The present multilevel systematic literature review (SLR) seeks to combine the findings of various literature as an appreciative theory (Nelson & Winter, 1982). Engaging in a study with a multilevel perspective means organizing the analysis into several nested niches, regimes, or landscapes that can share a hierarchical relationship. The multilevel perspective commonly distinguishes between the following three levels: macro, meso, and micro. Such typologies have raised the question of the possible interactions within and between levels (A. Smith, Voß, & Grin, 2010). The link between them can be assimilated into a nested hierarchy where the niche actors are embedded in the larger environment (Geels, 2002). The purpose of conducting our multilevel SLR is to specify the level of antecedent, process, and outcome of ambidexterity because observing organizations does not mean those three mechanisms happen at the same organizational level. In line with Molina-Azorín, Pereira-Moliner, Lopez-Gamero, Pertusa-Ortega, and Tari's (2020) arguments, our multilevel SLR aims to reduce the gap between micro and macro studies, which may also reduce the gap between academic research and practical outcomes.

# 3. Research method

The research methods we used to conduct our SLR to ensure reliability and replicability follow Tranfield, Denyer, and Smart's (2003) methodology. This SLR's objective is to inspect the state of knowledge about the ambidexterity of articles using multiple analysis levels. For this purpose, our review protocol is composed of two main phases: first, a preliminary expert survey highlighting key insights from ambidexterity researchers, which helps us in the second phase, examining articles from our SLR. We distributed the survey's answers to field experts, and that allowed us to narrow the coding of the articles subsequently selected in the review. The expert survey was also crucial to interpreting our SLR's findings.

## 3.1. Experts survey

For over 30 years, management sciences researchers have discussed organizational ambidexterity, making the question of the field's future direction a paramount consideration. Consequently, we designed an online survey and administered it to field experts to determine the targeted research avenues of ambidexterity. Like Holl, Grünbacher, and Rabiser (2012) and Wirtz, Pistoia, Ullrich, and Gottel (2016), who respectively conducted an expert survey and an SLR on capabilities supporting multiproduct lines and business models, we designed an expert survey to obtain valuable insights from the scientific community. This helped us develop our SLR to determine our study's scope and further interpret our results.

Three non-cumulative criteria were used to identify and include relevant experts in our mailing list. First, we selected researchers with over five papers published on ambidexterity; this number can be considered sufficient for mastering the topic. Second, we included scholars who published at least one article on ambidexterity in four-star or five-star management outlets based on the international journal ranking ABS 2021 used to measure academic performance (Kobarg, Wollersheim, Welpe, & Spörrle, 2017). Third, we also considered scholars who had published recent (less than three years prior, from 2018 to 2021) peer-reviewed articles on ambidexterity as the first or second authors and listed ambidexterity as their area of expertise on their Google Scholar profiles. From that search, 90 experts were selected to participate in the survey. Of these,

43 experts answered and 36 completed the survey, ensuring our response rate, and the number of respondents met the requirements applied to exploratory research design for preliminary insights (McCracken, 1988).

This expert survey included three main sections of questions on ambidexterity and its related research needs concerning general topic considerations, theoretical anchoring, and empirical approaches. Each one incorporated an open-ended question. Besides the survey responses, we also considered additional e-mails we received from experts.

According to the 36 experts, future research on ambidexterity appears promising (an average of 7.35 on an 11-point Likert scale). In response to the open question about the keywords related to ambidexterity in their current research, we observed some recurring answers, such as the following words: learning and capabilities (six occurrences), innovation related to technological innovation and information technology and also incremental versus radical innovation (five occurrences), and paradoxes or trade-offs (four occurrences).

We also assessed the relevance of specific thematics on ambidexterity on a five-point scale (1= strongly disagree to 5 = strongly agree) (see Table 3). Our results show multilevel research on ambidexterity is the most relevant for future research (4.28). The second most relevant is technological innovation (3.97), followed closely by interorganizational collaboration (3.82).

Table 3 : Relevance of Research on Thematics Associated with Ambidexterity

| **Rank*** | **Research area** | **Mean value** | **Standard deviation** |
|---|---|---|---|
| 1 | Multilevel | 4.28 | 0.76 |
| 2 | Technological innovation | 3.97 | 1.09 |
| 3 | Interorganizational collaboration | 3.82 | 0.94 |
| 4 | Dynamic capabilities | 3.74 | 1.29 |
| 5 | Small companies | 3.67 | 1.34 |

*Rank 1 = the most relevant

We questioned experts about the most interesting theoretical foundational anchoring for future research on ambidexterity with an open-ended question. Our text analysis revealed organizational learning, paradox, and resource theories are the most relevant theoretical backgrounds in future ambidexterity studies.

Following that, we also asked about the interest in specific theories, and we allowed several answers. This yielded similar results in line with the responses obtained from the open-ended question. Organizational theories received the most interest: organizational learning had the highest number of counts (29), followed by organizational adaptation (27), and organizational design (22). Table 4 provides an overview of the theoretical anchoring that raises significant interest in future research on ambidexterity.

Table 4 : Theoretical Anchoring for Future Ambidexterity Research

| Rank* | Theoretical anchoring | Counts |
|---|---|---|
| 1 | Organizational learning | 29 |
| 2 | Organizational adaptation | 27 |
| 3 | Organizational design | 22 |
| 4 | Leadership theory | 20 |
| 5 | Psychology | 14 |
| 6 | Human resource theory | 10 |
| 7 | Marketing | 7 |
| 8 | Other (specified as adaptability, flexibility, agility, paradox, innovation, information system, capabilities, strategy) | 7 |

*Rank 1 = highest interest

The responses collected indicated future studies should consider sequential, also called temporal, ambidexterity (26 counts) as the priority for experts to dedicate future research efforts, followed by contextual ambidexterity (23 counts) and structural or spatial ambidexterity (16 counts). The first implication is the dynamic view of ambidexterity may represent a research gap meriting further research to learn about “managing trade-offs temporally and dynamically and in a crisis”

(Expert #8). This echoes the need to alternate periods focused on exploitative activities with periods on explorative activities (Burgelman & Grove, 2007).

Besides theoretical gaps, it is also crucial to investigate empirical gaps. Therefore, we asked our experts an open-ended question to identify what they considered the most significant gaps. The results highlight once more the multilevel direction for future research, which includes a need to examine the combinations of precursors. Another future research avenue would be to adopt a dynamic view to capture how ambidexterity changes over time and to determine the temporal dynamics at the micro and macro levels. Therefore, we should test ambidexterity (as an interaction) and control for prior levels of both exploitation and exploration, as another expert suggested.

In response to a three-point Likert scale (1= extensively studied to 3 = very little studied) asking the extent to which ambidexterity has been studied at five different levels, our results show the interorganizational level has been the least studied (2.5), followed closely by the individual (2.47) and the team/group (2.33) levels. But business units and organizational ambidexterity appear extensively studied, with 1.85 and 1.23, respectively. Table 5 summarizes the results.

Table 5 : Analysis Levels the Least Studied Past Research on Ambidexterity

| **Rank** | **Research area** | **Mean value** | **Standard deviation** |
|---|---|---|---|
| 1 | Interorganizational | 2.5 | 0.65 |
| 2 | Individual | 2.47 | 0.56 |
| 3 | Team or group | 2.33 | 0.66 |
| 4 | Business units | 1.85 | 0.67 |
| 5 | Organizational | 1.23 | 0.43 |

*Rank 1 = the least studied

According to our expert survey, multilevel, multidisciplinary, and longitudinal studies are most needed, which suggests quantitative research methods are the most relevant for future research. Therefore, on a five-point scale (1 = strongly disagree to 5 = strongly agree), quantitative

methodology obtained the highest mean of 4.26. Qualitative methodology received a mean score of 4.05, which is also somewhat encouraging.

Considering the 19 industry types in the survey, the experts revealed the understudied industries in empirical works. According to the top ranking, agriculture, forestry, and fishing (15 counts) were the most understudied industries, followed by education (14 counts), water supply, sewerage, and waste management (12 counts), and professional, scientific, and technical activities (12 counts).

Our expert survey highlighted the importance of multilevel research on ambidexterity as the most relevant path for future research because the five levels (interorganizational, organizational, business unit, team/group, and individual) have not been studied equally well in past research. From this expert survey and its preliminary insights, we designed our SLR methodology to investigate multilevel ambidexterity further.

## 3.2. Systematic literature review methodology

To conduct our SLR, we followed the methodology Tranfield et al. (2003) proposed to provide a clear picture of what ambidexterity scholars have written and done (Fan, Breslin, Callahan, & Iszatt-White, 2022). Our review question is: What do we know and not know about ambidexterity from a multilevel perspective? To provide a detailed answer, in December 2021, we selected relevant articles by executing an electronic search on the following databases: Web of Science, Scopus, and EBSCO. Because we intended to examine all relevant studies, our search focused on English peer-reviewed articles published in academic journals before December 2021. Based on the selection process adopted by Schaltegger, Christ, Wenzig, and Burritt (2022), Table 6 shows the details of the selection search conducted on 3,209 articles. The final number (after data cleaning) was 59 peer-reviewed journal articles.

Following the previous literature review on ambidexterity, we used the terms ambidex* (Aman, Azam, & Akhtar, 2022; Turner et al., 2013) in a parallel search with exploit* and explorat* (Christofi et al., 2021). Given ambidexterity's multilevel nature and because ambidexterity can be studied in individuals, teams or groups, firms, and throughout interfirm relationships, such as

alliances, networks, or partnership units of analysis, we examined past studies on ambidexterity using more than one analysis level. We used the following keywords to search for them: multilevel, multi level, levels of analysis, macro, and micro. The keywords used resulted in 1,815 hits from EBSCO, 745 from Web of Science, and 649 from Scopus (Step 1).

Books, theses, case reports, editorial material, and conference proceedings were excluded from the search to focus on peer-reviewed published articles. Because the term ambidexterity is widely used by the scientific community, particularly in natural sciences and medicine, we adjusted the search criteria to narrow the research areas to social sciences, business, management, and accountability. The combination of results from the three databases resulted in 3,209 articles (Step 2).

After merging the results from the three databases, we identified 1,332 duplicated articles that we removed. We, therefore, consider 1,877 articles (Step 3).

Then, we assessed the 1,877 remaining studies based on title and abstract and excluded the papers unrelated to ambidexterity or its multilevel nature. We checked for intercoder reliability by assigning two samples of titles and abstracts randomly distributed to the two co-authors, who read them independently. The results were discussed to achieve agreement by all co-authors. Through applying the inclusion and exclusion criteria to the titles and abstracts, 1,492 articles were rejected because they did not fit our review topic. We, therefore, kept 385 articles (Step 4).

Although titles and abstracts were rigorously reviewed, our full-text analysis revealed many articles did not focus on ambidexterity, exploration and exploitation, or multiple levels of analysis. Therefore, the selection criteria previously described were also applied when reading the full texts. This close examination led to the rejection of 326 additional articles and restricted our number of articles to 59 (Step 5).

After in-depth readings, we obtained 59 eligible articles for our review. This number represents a satisfactory sample given the recent interest shift in studying ambidexterity from a single level to a multilevel perspective (Step 6).

Table 6 : Study Selection Process

| Selection Process | Step 1 | Step 2 | Step 3 | Step 4 | Step 5 | Step 6 | |
|---|---|---|---|---|---|---|---|
| **Database from origin to end 2021*** | Online search | Data merging | Data cleaning; removal of duplicates | Removal of articles based on title and abstract | Removal of articles based on full text | Articles included after an in-depth review | **Total** |
| **Web of science Search[1]** | 745 | | 3,209 | 1,877 | 385 | | |
| **Scopus Search[2]** | 649 | 3,209 | -1,332 | -1,492 | -326 | 59 | 59 |
| **EBSCO Search[3]** | 1,815 | | 1,877 | 385 | 59 | | |

** Limited to business and management, peer-reviewed, and English articles*

*[1]("ambidext*" or "exploit*" or "explorat*") AND ("multilevel" or "multilevel" or "levels of analysis" or "macro" or "micro" or "multi level") in titles, abstracts, or keywords*

*[2](TITLE-ABS-KEY ("ambidext*") OR TITLE-ABS-KEY (exploit*) OR TITLE-ABS-KEY (explorat*)) AND (TITLE-ABS-KEY ( "multilevel" ) OR TITLE-ABS-KEY ( "levels of analysis") OR TITLE-ABS-KEY (macro) OR TITLE-ABS-KEY (micro) OR TITLE-ABS-KEY (« multi level »))*

*[3]("ambidext*" or "exploit*" or "explorat*") AND ("multilevel" or "multilevel" or "levels of analysis" or "macro" or "micro" or "multi level") in titles, abstracts, or keywords*

Finally, the coding phase of the selected articles occurred. Appendix 1 provides the complete list of the 59 articles (by author and year). Each has an ID number and is listed in chronological order. The methodological approaches of the 59 selected multilevel studies are also provided. The authors, outlet, methods, analysis level used, sample, and principal findings have been completed for each selected article. Pivotal patterns concerning companies and geographical coverage, the type of theories used, the ambidexterity lens, and the call for further studies have emerged from the data analysis. The following analysis resulted from the discussions between the co-authors, who did not differ in their interpretations of the findings.

# 4. Findings and literature analysis

## 4.1. Theoretical anchoring

Our SLR's results show diverse theoretical stands have been taken. Few scholars have considered organizational ambidexterity a theoretical lens to explain a social phenomenon (Simsek, 2009; Yu, Patterson, & de Ruyter, 2013). Ambidexterity describes how to deal with paradoxical situations, and we observe multilevel ambidexterity studies have increased interest in strategic human resources management (Mom et al., 2019; Stokes et al., 2019; Swart, Turner, Van Rossenberg, & Kinnie, 2019). In addition, social identity theory has emerged as a relevant theory to understand how individuals position themselves according to the group to which they belong (Y. Y. Chang, Chen, Chen, & Chang, 2019; Silalahi, Firmanzah, Ekaputra, Rachmawati, & Pasaribu, 2021). Although theories from human resources and social identity theory are appropriate for studying lower levels of ambidexterity, strategic management provides higher-level insights because strategy aims to explain the difference between firms' performances. Strategic management-related theories, such as the resource-based view (W. Li & Wang, 2019), corporate entrepreneurship (Hughes, Hughes, Stokes, Lee, Rodgers, & Degbey, 2020), or organization theory (Ambos, Makela, Birkinshaw, & D'Este, 2008), permit a more thorough understanding of higher-level ambidexterity, highlighting the importance of the alignment between the theory, the level of analysis, and the studied variables. Therefore, human resources management and strategic management can be considered a continuum between individual and interorganizational ambidexterity.

## 4.2. Methodological approaches

A study's theoretical fit is crucial for publication; therefore, we examine the methodological approaches used in multilevel studies to understand their implications. Specific methodologies emerge from the 47 empirical multilevel studies. Our findings reveal 26 quantitative studies predominate (55.3%) among the empirical studies. In particular, top journal articles use the statistical techniques of Structural Equation Modeling (SEM) and Hierarchical Linear Modeling (HLM) to assess the relationships between multilevel constructs. Despite this predominant inclination for quantitative studies, which permit the generalization of results, 19

qualitative studies (case studies) were undertaken to unveil the complexity of embedded ambidexterity (40.4%). Finally, only two papers use the mixed-method technique (4.3%).

## 4.3. Measurements

Measurement choice goes along with the methodological design. When examining the studies measuring ambidexterity as a construct, we observe some divergences in computing exploration and exploitation items to obtain ambidexterity's balance level. Based on the average of exploration and exploitation, scholars have used different calculations, such as multiplication (R. Wang & Gibbons, 2021; Yu, Gudergan, & Chen, 2020), the absolute difference (Y. Y. Chang, 2015; Venugopal, Krishnan, Upadhyayula, & Kumar, 2020; J.Y. Lee et al., 2020), and addition (Jansen et al., 2006; Kiss, Libaers, Barr, Wang, & Zachary, 2020; Silalahi et al., 2021) of ambidexterity's two components. Among those references, Jansen et al. (2006) and Yu et al. (2020) proceeded to scale development considering the team and individual levels of analysis. The classical absolute difference between exploration and exploitation supports ambidexterity's balancing nature, meaning the lower the result, the higher the ambidexterity level the firm achieves (Cao, Gedajlovic, & Zhang, 2009). Conversely, the multiplication and addition between exploration and exploitation support the combined nature of ambidexterity, where the subconstructs are independent and complementary (Lubatkin et al., 2006). Several authors have used absolute difference and multiplication in their multilevel studies to increase the accuracy of ambidexterity levels in their results (Y. Y. Chang, 2015, 2016; J. Y. Lee et al., 2020; Venugopal et al., 2020).

Multilevel quantitative studies have applied different constructs to measure ambidexterity. The individual ambidexterity construct often comes from Mom et al. (2009). This scale has been used by Kobarg et al. (2017), Mom et al. (2019), and Zhang, Chen, O'Kane, Xiang, and Wang (2020). Hirst, Van Knippenberg, Zhou, Cherrie, and Tsai (2018) developed a scale to measure team exploration and exploitation climate, and the team ambidexterity construct used by Silalahi et al. (2021) was adapted based on Kostopoulos and Bozionelos (2011) and Jansen et al. (2016). When considering the business-unit level of analysis, the ambidexterity construct often comes from Lubatkin et al. (2006), which was used by Y. Y. Chang (2015, 2016) and Yu et al. (2013). This scale is also applicable for measuring ambidexterity at the organizational level, as done by Swart et al. (2019) and Venugopal et al. (2020). Organizational ambidexterity is typically measured with Jansen et al.'s (2006) construct and has been used in a multilevel

context by Barrutia and Echebarria (2019), Kiss et al. (2020), and Mom et al. (2019). Overall, few reliable scales have been used to study ambidexterity in specific levels of analysis, and no reliable scale emerged from our study to measure ambidexterity at the interorganizational level.

These discussed measurements are used to measure ambidexterity as a behavior or an outcome. Considering ambidexterity as an outcome, which has been done frequently, enables past research to identify its antecedents. In multilevel studies, ambidexterity has been studied as an outcome (54%), a behavioral precursor (18%), or a procedural mechanism (28%). Scant studies use ambidexterity as an independent variable to study the possible effects on performance.

## 4.4. Research context

Assessing the ambidexterity level is feasible for almost any organization, so it is crucial to identify if ambidexterity has been studied homogeneously through sufficiently varied research settings. Appendix 2 displays the research context of the selected empirical studies. Industries related to the public sector, government, education, and health care represent most of the sampled firms. We also acknowledge a growing interest in innovative industries, such as health-related firms (biotechnology or pharmaceutical companies), information technology-related firms, and service firms. According to an OECD Science (2017) report, IT, the medical sector, and financial services, biotechnology, engineering, and transport industries are part of the top-ten sectors for innovation intensity. Additionally, the firms in those industries submit most of the patent applications (OECD Science, 2017). Regarding the localization of the companies studied in empirical multilevel studies, the SLR shows most empirical research is conducted in Western countries, Europe (the United Kingdom in particular), and the United States. Some studies have also been conducted in a few emerging countries, such as China, India, and Taiwan.

## 4.5. Ambidexterity's antecedents

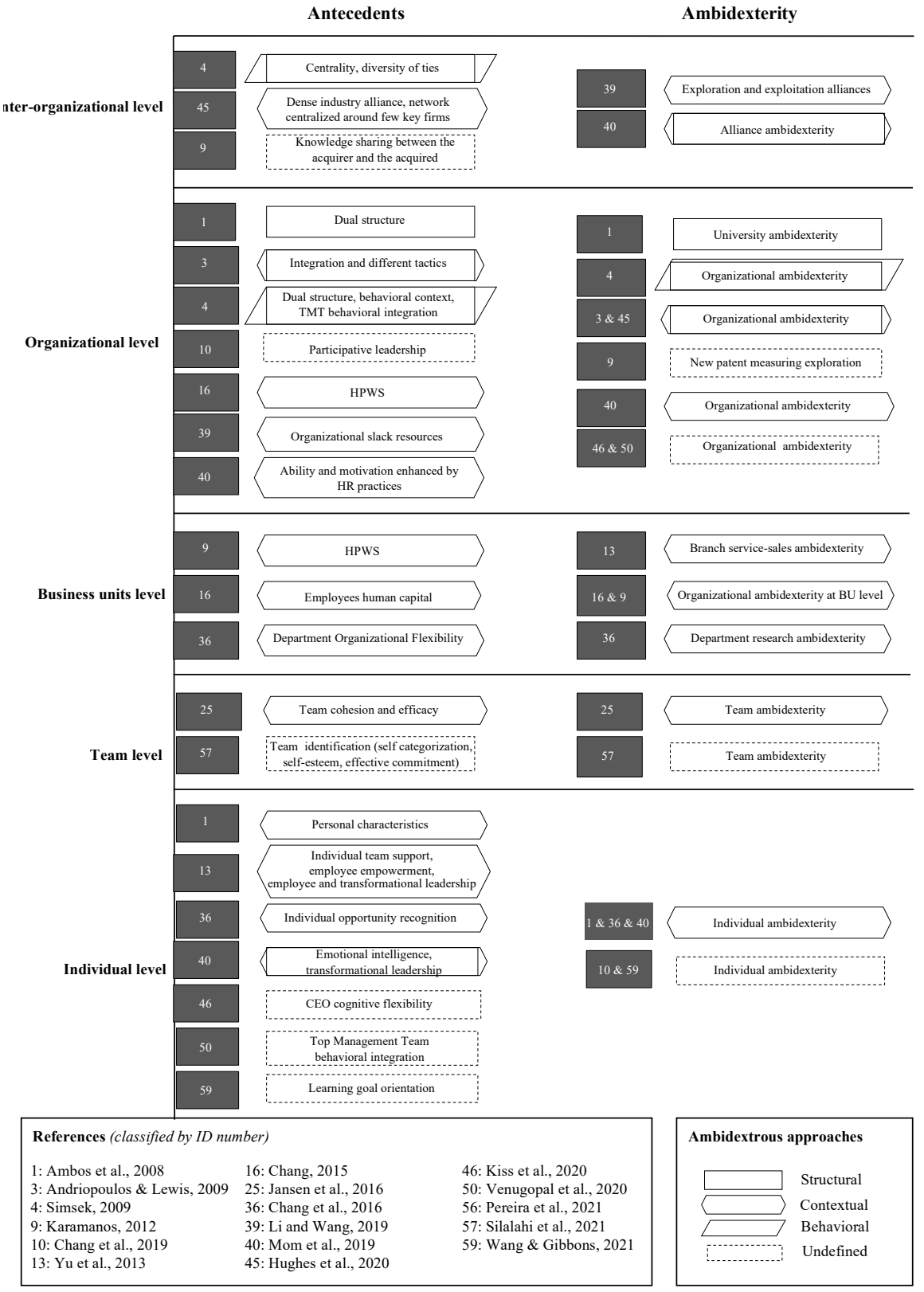
Analysis of the multilevel ambidexterity studies indicates ambidexterity's antecedents have been studied haphazardly in the 28 quantitative and mixed-method studies. We compiled the past results to comprehend the relative effects between the highlighted antecedents. Figure 3 depicts ambidexterity's antecedents according to the analysis level from which they have been studied. The papers' ID numbers are shown in gray. Neither all 59 articles nor all the

quantitative studies are depicted in the figure 3 because only the quantitative studies consider ambidexterity as a dependent variable. Its antecedents, as independent variables, are mentioned in Figure 3. The most-represented analysis levels used in multilevel studies are organizational and individual. At the individual level, personal characteristics and skills dominate. At the team level, commitment to the team is the team-level's primary ambidexterity antecedent. There are less visible similarities concerning the precursors at the business-unit level. Flexibility, high-performance work systems (HPWS), and human capital are broad terms that could be better and more-thoroughly specified regarding business-unit ambidexterity. At the organizational level, the dual structure is a critical antecedent when studying organizational structural ambidexterity. HR practices are also associated with contextual ambidexterity at the organizational level. The focal firm's position is a common thread in antecedent studies at the interorganizational level.

## 4.6. Approaches of ambidexterity's antecedents

As previously explained, we know from the literature that ambidexterity can be studied through three primary approaches: structural, behavioral, and contextual. Figure 3 also highlights ambidexterity's different approaches and antecedents at different analysis levels. We observe some approaches have been studied more at specific analysis levels. When analyzing ambidexterity's antecedents, ambidexterity's structural ambidexterity and behavioral approach ambidexterity are related to higher levels of analysis; ambidexterity's contextual approach is more specific to lower levels. More specifically, ambidexterity's behavioral and structural approaches are used at the organizational and interorganizational levels. But ambidexterity's contextual approach is used at the individual and business unit levels. This observation holds except for Mom et al. (2019), who considered contextual and structural approaches in their organizational- and individual-level study. It is also noteworthy the contextual approach is the most-used form of ambidexterity in multilevel ambidexterity studies.

Figure 3 : Multilevel framework of ambidexterity antecedents




HPWS: High-Performance Work Systems

TMT: Top Management Team

# 5. Research Agenda

Based on our SLR, we reveal five critical research avenues for ambidexterity using a multilevel perspective. They are (a) strengthening the theoretical foundations, (b) operationalizing the constructs, (c) further exploring specific analysis levels, (d) drawing interactions between different analysis levels, and (e) enriching the empirical contexts of multilevel ambidexterity studies.

## 5.1. Strengthening the theoretical foundations

### 5.1.1. Using a wide range of theories across the different analysis levels

From our in-depth analysis of 59 articles studying the tensions between exploration and exploitation at multiple analysis levels, we argue ambidexterity can be applied at micro and macro levels, or the two sub-components of exploration and exploitation can complement each other to explain a phenomenon happening at lower and higher analysis levels. This way, conceptual research provides insights into the management-related theories appropriate for multilevel analysis (Molina-Azorín et al., 2020). For example, innovation and paradox research on diverse ambidexterity-mobilized fields of study, such as sensemaking and cognition research, has investigated this multilevel fit (Andriopoulos & Lewis, 2009). Another example would be the development of ambidextrous organizational behavior research requesting insights from psychological research to comprehend individual resistance to change (Bidmon & Boe-Lillegraven, 2020). Therefore, multilevel ambidexterity compels scholars to compile various theoretical backgrounds to tackle complex phenomena across different analysis levels. From our SLR, the range of theories used to cover ambidexterity from the individual to the interorganizational level is expanding.

Table 7 presents the different fields of study mobilized at various analysis levels. For instance, social connections are restricted to the studies of interorganizational ambidexterity and concern the following antecedents: the diversity of ties, centrality, the density of industry alliances, and networks centralized around a few key firms. But, as part of multilevel studies, the dominant field investigating organizational ambidexterity is strategic optimization. In the interorganizational and organizational context, both contextual ambidexterity and structural

ambidexterity are considered enablers for managing R&D exploratory alliances in exploiting existing technological bases to realize existing strategies.

Concerning the debate on ambidexterity's microfoundations in strategic partnerships, Pereira, Patnaik, Temouri, Tarba, Malik, and Bustinza (2021) studied how external partnerships fostered the evolution of an enzyme manufacturing company toward a full-fledged biopharmaceutical company. Studies have shown the role of leadership is crucial to developing the appropriate conditions for exploration and exploitation. Leadership and human resources cover a broader range of levels: individual, team, business unit, and organizational, but personal abilities are restricted to individual and team-level studies. Knowledge management is the underlying field for investigating individual and interorganizational levels, but it does not consider intermediary levels, such as teams, business units, and organizations. Furthermore, knowledge management has approached ambidexterity from a contextual and structural perspective, rather than a sequential approach. Table 7 also depicts a list of ambidexterity's antecedents, which are classified by analysis level and category.

Table 7 : Fields of Study of Multilevel Ambidexterity

| Levels of analysis | Ambidexterity's antecedents | ID | Categorization |
|---|---|---|---|
| Interorganizational | Diversity of ties | 4 | Social connections |
| | Centrality | 45 | Social connections |
| | The density of industry alliance | 9 | Social connections |
| | Network centralized around a few key firms | 9 | Social connections |
| | Knowledge sharing in an acquisition context | 9 | Strategic optimization |
| Organizational | Dual structure | 1, 4 | Strategic optimization |
| | Integration and different tactics | 3 | Strategic optimization |
| | Behavioral context | 4 | Strategic optimization |
| | Organizational slack resources | 39 | Strategic optimization |
| | High-performance work systems | 16 | Intellectual capital management |
| | Ability and motivation enhanced by HR practices | 40 | Intellectual capital management |
| | TMT Behavioral integration | 4 | Collective harmonization |
| | Participative leadership | 36 | Collective harmonization |
| Business-unit | High-performance work systems | 9 | Intellectual capital management |
| | Employee human capital | 16 | Intellectual capital management |
| | Department organizational flexibility | 24 | Strategic optimization |
| Group | Team cohesion | 25 | Soft skills enhancement |
| | Team efficacy | 25 | Soft skills enhancement |
| | Team identification (self-categorization, self-esteem, affective commitment) | 57 | Intellectual capital management |
| Individual | Personal characteristics | 1 | Soft skills enhancement |
| | Individual team support | 13 | Soft skills enhancement |
| | Employee empowerment | 13 | Soft skills enhancement |
| | Emotional intelligence | 40 | Soft skills enhancement |
| | Learning goal orientation | 59 | Soft skills enhancement |
| | Employee and transformational leadership | 13 | Collective harmonization |
| | CEO cognitive flexibility | 46 | Collective harmonization |
| | TMT behavioral integration | 50 | Collective harmonization |
| | Individual opportunity recognition | 24 | Intellectual capital management |
| References (classified by ID number) | 1: Ambos et al., 2008 | 36: Y. Y. Chang et al., 2019 | |
| | 3: Andriopoulos & Lewis, 2009 | 39: Li and Wang, 2019 | |
| | 4: Simsek, 2009 | 40: Mom et al., 2019 | |
| | 9: Karamanos, 2012 | 45: Hughes et al., 2020 | |
| | 13: Yu et al., 2013 | 46 : Kiss et al., 2020 | |
| | 16: Y. Y. Chang, 2015 | 50 : Venugopal et al., 2020 | |
| | 24: Y. C. Chang et al., 2016 | 57 : Silalahi et al., 2021 | |
| | 25: Jansen et al., 2016 | 59: R. Wang & Gibbons, 2021 | |

### 5.1.2. Strengthening the stream of sequential/temporal ambidexterity

Based on our SLR, we call for further studies concerning sequential/temporal ambidexterity. This call is consistent with the results obtained from our expert survey that positions sequential (also called temporal) ambidexterity as a more urgent path for further studies than contextual and structural ambidexterity. To address ambidexterity's temporal nature, researchers could employ a dynamic perspective. Ambidexterity is not innate; developing it requires significant effort by leaders and managers over time because organizational ambidexterity is an evolutionary adaptive process that can be developed when nurtured. But this state of balance is changeable and can evolve from one period to another, implying a continuous investment of efforts and resources to reap the benefits of organizational ambidexterity. Current studies have shown little evidence of whether and how time affects the relationships between ambidexterity enablers, ambidexterity, and performance (Silalahi et al., 2021). And yet, this approach to ambidexterity is the most appropriate lens to examine the evolution of the levels of exploration and exploitation over time. Based on recent studies, such as Bidmon and Boe-Lillegraven (2020), J. Y. Lee et al. (2020), and Pereira et al. (2021), we argue scholars and practitioners should consider ambidexterity's dynamic aspect and its continuous necessary adjustments to benefit from it. Studying its dynamic aspect would offer insights into the requisite switches and sequentiality between exploration and exploitation across the different levels. We assume ambidexterity can evolve from the individual to the interorganizational level depending on constraints, demands, and opportunities, which must be specified in further research. However, such interlevel relations require researchers to operationalize the constructs correctly.

## 5.2. Operationalization of the constructs

### 5.2.1. Using appropriate scales given the analysis level

Reviewing 26 quantitative papers measuring ambidexterity at different levels, we note scholars involved in multilevel ambidexterity studies may face methodological challenges. Measuring ambidexterity at multiple levels requires using relevant constructs, which is not a straightforward task (Turner et al., 2013) notably because ambidexterity constructs may need to be adapted according to the focal level of analysis (Junni et al., 2013). For instance, a methodological issue could emerge when applying the measurement of ambidextrous leadership to the organizational, team, and individual levels (Mueller et al., 2020). In line with

Turner et al.'s (2013) review results, we claim theoretical shortcomings are related to methodological issues. To our knowledge, only Mom et al.'s (2019) study has measured ambidexterity rigorously using validated scales at more than one level: the individual and organizational levels. Therefore, future empirical studies must use the correct scale at the right level of analysis. Too frequently, scholars use a proper ambidexterity reflective scale at a given analysis level and use a proxy to measure ambidexterity for another analysis level. The operationalization of scales also questions the computation made between exploration and exploitation.

### 5.2.2. Using continuous or orthogonal scales depending on the analysis level

From our SLR, we argue balancing exploration and exploitation is questionable when considering the organization as an entity composed of employees, teams, and business units surrounded by partners. This argument relates to the current debate about whether exploration and exploitation are continuous or orthogonal variables (Gupta et al., 2006), which is also a critical debate from a multilevel perspective (Kauppila, 2010). Past considerations of ambidexterity have considered exploration and exploitation as two ends of a continuum (Lavie & Rosenkopf, 2006; March, 1991; Uotila et al., 2009). But other researchers consider exploitation and exploration as orthogonal variables using two distinct dimensions, in the sense a firm should perform well in both exploration and exploitation (Gibson & Birkinshaw, 2004; He & Wong, 2004; Jansen, Tempelaar, Van den Bosch, & Volberda, 2009).

From a multilevel perspective, using orthogonal variables makes more sense when considering interorganizational ambidexterity: perhaps, one partner would excel at exploration and another at exploitation. But using continuous variables at an organizational level would be more meaningful to balance exploration and exploitation activities at the firm level (Kauppila, 2010). Similarly, because exploration and exploitation are mutually exclusive at the individual level, researchers have encouraged implementing a continuous measure of these two constructs as the opposing ends of a continuum (Gupta et al., 2006; Lavie et al., 2010). However, using a continuum at the individual level does not lead to a consensus. For instance, an orthogonal measure was applied in Kauppila and Tempelaar's (2016) study, which found unlike a continuum, an orthogonal measure identifies the changes among employees with low and high involvement in exploration and exploitation activities. Further research on defining the operationalization of ambidexterity at different levels of analysis is needed to know if firms

should strive to maintain a balance between exploration and exploitation or should make efforts in both activities because of their external networks with partners and their internal structure and the existence—or not—of business units.

### 5.2.3. Revealing the optimal degree of ambidexterity according to the analysis level

Referring to Rapp¸ Bachrach, Karen, Hughes, Sharma, and Voorhees (2017), a fundamental question emerged regarding whether an optimal ambidexterity level does indeed exists. If so, it's necessary to know the optimal ambidexterity level so firms can better focus their efforts. At the organizational level, should the focal firm's business units be balanced, or should each business unit balance explorative and exploitative activities independently (A. Kim, 2019)? The latter option would imply ambidexterity would be resolved at a lower level. One must distinguish between low- and high-performing employees if one or the other is more ambidextrous because of their ability and skill levels to determine if ambidexterity should be achieved at the individual level. Moreover, it is unclear whether, or when, middle managers who are dealing with exploitation/exploration tensions manage them well enough to achieve a balance that contributes to organizational ambidexterity (Mom et al., 2019).

### 5.2.4. Identifying an ambidexterity equilibrium in longitudinal studies

In future research, except when adopting a sequential approach, the relevance of time must be considered to explain the transition from a non-ambidextrous company to an ambidextrous one when it reaches high levels of exploitation and exploration or equilibrium. And to do so, longitudinal studies would enable analyzing the synergies, links, and dynamics between each criterion throughout ambidexterity's implementation (Asif, 2017). We know many antecedents can foster the organizational ambidexterity level. However, we are unsure how those antecedents can turn a non-ambidextrous company into an ambidextrous one. To our knowledge, this transition has not been studied, and the transition to equilibrium has not been investigated yet. We also lack studies explaining organizational ambidexterity's growth phase and firms' abilities to reach equilibrium, considering their embedded levels. For instance, we recommend examining ambidexterity in start-ups during their growth phase to observe how ambidexterity strengthens—or not—across different analysis levels. Moreover, from a temporal approach, we argue companies must constantly adjust their activities once the ambidextrous transition occurs. In this regard, we do not understand how periodic switches between

ambidextrous and non-ambidextrous phases are managed across organizational levels and may require a more thorough understanding of specific analysis levels, such as the interorganizational one.

## 5.3. Further exploring specific analysis levels

### 5.3.1. Expanding interorganizational multilevel studies

Regarding interlevel analysis, the organizational analysis level is, unsurprisingly, the most-used level within the scope of articles selected in our SLR. Similarly, experts also highlighted organizational-level ambidexterity is the level that requires the smallest amount of future work. In contrast, the interorganizational level is the least-used analysis level, a finding corroborated by our 36 experts. So far, ambidexterity has only been studied at the interorganizational level in five instances. Those instances are U.S. biotechnology alliances (Karamanos, 2012; W. Li & Wang, 2019), Indian biotechnology alliances (Pereira et al., 2021), partnerships of companies in the fuel cell industry (Russo & Vurro, 2010), and networks of Spanish municipalities (Barrutia & Echebarria, 2019).

Exploitation is considered relatively easy to achieve (compared to exploration) at the interorganizational level. In a closed-alliance network, reach centrality can be a means to develop explorative innovation thanks to a short, relatively quick, and less-risky knowledge exchange (Karamanos, 2012). In this case, interorganizational antecedents can facilitate achieving organizational ambidexterity. However, interfirm-level ambidexterity's precursors remain unclear. For instance, Asif (2017) argued the diversity of ties within a network and the centrality of a firm in that network could be potential determinants of ambidexterity. Therefore, researchers should further investigate the relative importance of each antecedent across levels to come to an agreement on the most relevant. We know social context is a crucial aspect that fosters interorganizational ambidexterity; nevertheless, the role of social liabilities across levels is not well-defined (Glaser, Fourné, & Elfring, 2015).

The expert survey results also highlighted the need for interorganizational-level research because organizations do not work independently in silos. Therefore, to develop an effective operational strategy, it is vital to consider their external relationships and the business environment in which they operate (P. Smith & Beretta, 2021). Interorganizational studies in

which organizational ambidexterity is considered should focus on the firm's ecosystem, value chain, alliance, or M&A context (Hughes et al., 2020; P. Smith & Beretta, 2021). Interorganizational ambidexterity is not easily distinguishable theoretically at the alliance level because exploration and exploitation alliances are considered separate dimensions. The balance between exploration and exploitation is visible at the higher levels such as at the ecosystem level or lower levels by examining the firm portfolio level. Understanding where the equilibrium is achieved or where the trade-off is resolved is the critical challenge to overcome in further multilevel studies. For instance, future research should focus on organizational factors and environmental contingencies to determine whether and how companies achieve organizational-level ambidexterity by balancing exploration and exploitation alliances. Additionally, more confusing interactions between organization conditions and industry context must be disentangled (Li & Wang, 2019). Extending past studies with additional levels of analysis would improve our understanding of ambidexterity's complex ability while considering level-specific tensions.

### 5.3.2. Uncovering ambidexterity's level-specific tensions

Intralevel tensions must be understood before coming to conclusions about multilevel interactions. An in-depth review of our SLR articles reveals each level holds specific tensions. At the organizational level, a paradox between long-term adaptability and short-term survival exists. At the project level, a dilemma between possibilities and constraints is revealed. At the group level, a debate arises about whether to strengthen diversity or cohesiveness. Finally, at the individual level, there is a paradox between passion and discipline (Andriopoulos & Lewis, 2010), which raises the concern about whether we should focus attention on exploration and exploitation regardless of the analysis level or adapt to the level-specific tensions individuals, groups, business units, firms, or groups of firms face. We believe relying on more specific tensions—at specific levels—would be more meaningful in future studies.

Although these distortions matter to future research, we argue tensions are interwoven across the organizational levels. However, few studies have focused on their relative importance based on the current state of the literature captured by our SLR. When comparing the tensions, Ambos et al. (2008) claimed they are more vital at the organizational level than at the individual one. This comparison is possible by studying the combined effects of antecedents and the synergies between them (Christofi et al., 2021). Concerning individual intralevel interactions, current

studies have quantified the individual capacity to act ambidextrously at any hierarchical or experience level, thanks to studies on hierarchical levels (e.g., Nilsson, 2012). But Swart et al. (2019) point out no studies have investigated the development of ambidexterity across different levels of seniority. Thus, we wonder whether individual ambidextrous capability evolves through career experience and how individuals manage the tensions between exploration and exploitation throughout their careers. Understanding the evolution of specific ambidexterity levels is a prerequisite for further studies considering the interactions between several analysis levels.

## 5.4. Drawing interactions between different analysis levels

### 5.4.1. Increasing the number of analysis levels

The first thing scholars should do to determine the interactions between the different analysis levels is to increase the number of levels considered in each empirical study. When examining a multilevel phenomenon, comparisons between levels prove vital for establishing potential interactions. Raisch and Birkinshaw (2008) called for studying links, complementarity, and interrelations between levels, specifically from the lens of contextual ambidexterity. Yet, from our updated SLR, few studies have uncovered various tensions and paradoxes according to the analysis level (Andriopoulos & Lewis, 2009, 2010). Because ambidexterity is a multilevel ability, Y. Y. Chang (2015) encouraged more research on the interaction, relationships, and ties between individuals, firms, and industries. However, an underlying question about cross-level interactions is whether we can compare ambidexterity across various levels (individual, team, business unit, organizational, and interorganizational) or whether the observations refer to a single form of ambidexterity occurring at different levels in different perspectives and levels of attention to detail (Mom et al., 2019). We argue one prerequisite to addressing this issue would be combining all five levels of analysis to get a complete and detailed overview of ambidexterity. From there, we could see if the different levels interact or if some remain isolated.

### 5.4.2. Considering isolated ambidexterity at a specific analysis level

From our SLR, we note ambidexterity's (alleged) multilevel nature may imply adopting a critical view of each level's relative importance and its interactions or non-interactions to

compare levels. Related to this point, Kassotaki, Paroutis, and Morrell (2019) questioned the degree of possible interaction between the different analysis levels. What if ambidexterity is nestled at a single level, such as at the individual CEO level? In that case, would individual ambidexterity still benefit the company? Referring to F. Wang & Jiang (2009), if ambidexterity is limited to a specific analysis level in some companies without any interaction with the higher level (interorganizational level) or lower levels (business unit, team, individual), what will be the effect on performance? Is each level of the company equally vital in terms of ambidexterity? For example, could team-level ambidexterity directly affect organizational ambidexterity without needing intermediary business-unit ambidexterity? And this raises the question of whether to develop ambidexterity across several levels or only at a specific one. We encourage further research to investigate this question. Moreover, can a firm offset its poor organizational ambidexterity by relying on interorganizational ambidexterity while maintaining a high level of performance? Building on Zhang et al. (2020), we ask: at what level does ambidexterity have the greatest, or the least, impact on performance: is it at the individual, team, business unit, organizational, or interorganizational? Those questions are worth investigating while ensuring ambidexterity that each level leads to ambidexterity at a higher level of analysis, or potentially, the reverse.

### 5.4.3. Clarifying the direction of causation effects

Another current debate on interactions across levels concerns top-down and bottom-up effects. Our SLR shows the direction of influence and causality of effects are controversial. For instance, do the interactions between ambidextrous managers contribute to organizational ambidexterity or the other way around? Building on Mom et al. (2019) and Burgess, Strauss, Currie, and Wood (2015), we call for further clarification on the importance of individuals in developing higher-level ambidexterity and on the contingency with market aspects, such as industry type and environmental dynamism. We know supportive leadership from senior executives at the organizational level has a top-down effect on team ambidexterity (Jansen et al., 2016). But Jansen et al. (2016) suggested investigating a bottom-up effect concerning how much individuals' skills and abilities support team-level ambidexterity. Another path for further study related to a top-down moderating effect would be to examine the organizational social climate (Collins & Smith, 2006). Although ambidexterity may interact between levels, proving its effect on performance remains challenging.

### 5.4.4. Assessing ambidexterity's effects on performance for each analysis level

Since Junni et al.'s (2013) research, no study has coherently tackled the distinctive effects of all analysis levels' ambidexterity on performance. Many studies reveal the ambidexterity benefits to firms concerning performance, but very few studies have studied the cost incurred to develop, implement, and manage ambidexterity throughout all the organizational levels. As per Pertusa-Ortega et al. (2020), we point out we have no clue if the benefits of balancing exploration and exploitation exceed its development and maintenance costs. We agree with Coradi, Heinzen, and Boutellier (2015) that using other empirical settings would enable us to develop our knowledge of the potential trade-off between exploration and exploitation across the analysis levels. Further research could also measure if organizational resource allocation moderates the relationship between ambidexterity and performance (Kobarg et al., 2017). Understanding the advantages and drawbacks of ambidexterity outcomes is needed. Thus, we call for further research on the costs and benefits of developing and maintaining a balance between exploration and exploitation across organizational layers. Longitudinal studies must be designed to measure ambidexterity's effects at one level on ambidexterity at another level and also ambidexterity's effects on performance at each level.

### 5.4.5. Designing longitudinal studies

Of the 47 empirical studies considered in our SLR, most research designs are cross-sectional, and this is particularly true about quantitative studies. We noted only one longitudinal quantitative study on ambidexterity using multiple analysis levels. Only Russo and Vurro (2010) have delved into a longitudinal research design (for seven years) by studying the internal and external strategies related to 153 companies' exploration and exploitation. Their main finding is companies focused internally on exploitation only tend to rely on exploration-related external partnerships. Conversely, companies with an internal focus on exploration balance it thanks to external exploitation (Russo & Vurro, 2010). These cross-boundary strategies contribute to the link between organizational and interorganizational levels. Unfortunately, these results do not value the longitudinal specificity of the data used. Because time series or panel data is a condition for establishing causal relationships between the listed antecedents and ambidexterity, we need more longitudinal quantitative studies to comprehend the causal effects links between variables. Further research can also expand or replicate past studies regarding

their empirical contexts by drawing causality between different levels, predictors, and outcomes.

### 5.4.6. Conducting process models and qualitative research

There is indeed a lack of longitudinal quantitative studies on multilevel ambidexterity, but some case studies have been conducted over several years to provide results on this area (Andriopoulos & Lewis, 2009; Pereira et al., 2021; Tillement, Garcias, Minguet, & Duboc, 2019; F. Wang & Jiang, 2009). Those qualitative studies adopted different angles of analysis across hierarchical organizational levels (Andriopoulos & Lewis, 2009) from micro to macro levels (Tillement et al., 2019; F. Wang & Jiang, 2009) and at organizational and interorganizational levels (Pereira et al., 2021).

Considering the dynamics among levels, Andriopoulos and Lewis (2010) suggested using process models depicting various phases to observe the evolution of an ambidextrous company. In line with Zimmermann et al. (2015), we believe studying the transition and dynamics of the balance between exploration and exploitation at the individual level may provide fruitful insights into the literature. Moreover, we lack knowledge about how much ambidexterity depends upon the levels' interactions (Mom et al., 2019). Beyond the interlevel dynamics, the comparison between top-down and bottom-up effects across levels remains understudied because the two mechanisms have been investigated in silos. Understanding those cross-level synergies and interactions is essential to developing a holistic understanding of the ambidextrous ability across the organizational levels.

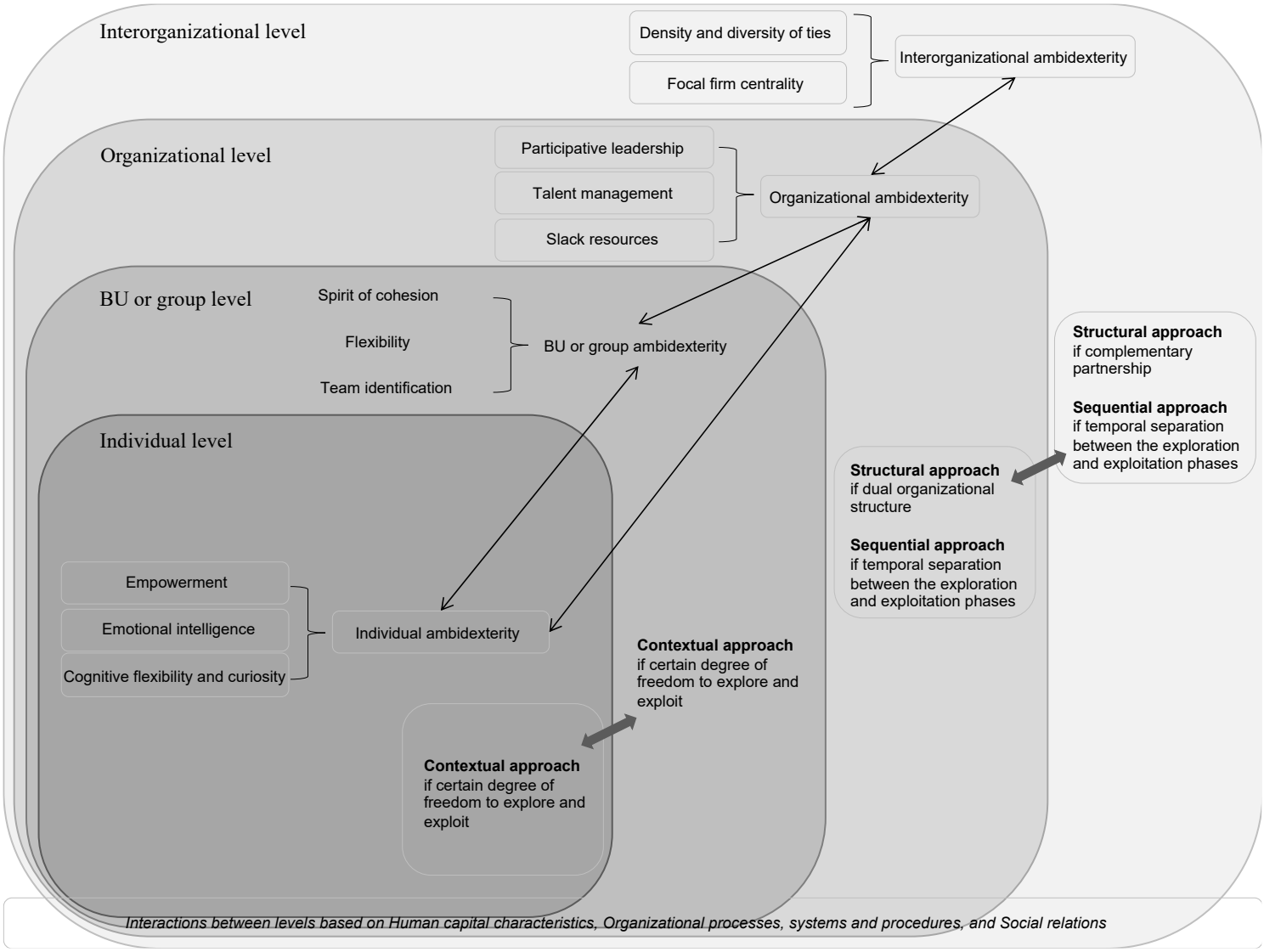
From our expert survey and SLR, we argue a path exists for further qualitative research perspectives. For instance, because we do not know how managers individually balance exploration and exploitation to foster ambidexterity in their teams, measuring managerial ambidexterity's effects on team ambidexterity remains difficult. Therefore, we call for multilevel research using qualitative research methods to explore this.

### 5.4.7. Multilevel and multiapproach framework

So far, we have revealed the visible patterns in multilevel studies. The reviewed studies are eclectic and focus on different levels of analysis; therefore, it is useful to theoretically model the current knowledge on multilevel ambidexterity.

Figure 4 makes a distinction between the different organizational levels from the individual to the interorganizational level, including the BU or group level. As shown, the levels of analysis are nested within each other. Interactions between levels are represented by double sided arrows indicating bottom-up and top-down interactions. The levels are respectively linked with the level situated above or below. There is an exception for the organizational and individual levels, which are closely related, although the relationship ignores the group level. Studies focusing on organizational and individual levels are the most prominent ones. In fact, it is relevant to aggregate individuals' characteristics for SMEs considering that the BU and group level corresponds to the organizational level. Theorizing on the organizational and individual level has also been commonly done from the microfoundation perspective (Felin, Foss, & Ployart, 2015).

Figure 4 : Conceptual framework




As mentioned previously, the body of knowledge on ambidexterity contains a wide range of arguments and hypotheses, and we have revealed many predictors of ambidexterity. We aim to highlight some of the major themes found in the body of existing multilevel studies. Individual characteristics related to empowerment, emotional intelligence, cognitive flexibility, and curiosity represent key predictors of individual ambidexterity. More largely, they are associated with human capital characteristics. At the group or BU level, spirit of cohesion, flexibility, and team identification contribute to this level's ambidexterity. At the organizational level, participative leadership, talent management, and slack resources are three favorable elements for ambidexterity, which enable the whole organization to become involved in exploitation and exploration activities. At the interorganizational level, the density and diversity of ties plus the focal firm's centrality count as predictors of interorganizational ambidexterity. In short,

antecedents are mostly level specific. It is noteworthy to mention flexibility is an important microlevel aspect contributing to lower-level ambidexterity (at individual, group, and BU levels).

The mentioned antecedents are also related to the approach of ambidexterity. These approaches are non-exclusive; however, when considering the multilevel perspective, it opposes the micro-level (contextual) and the macro-level (structural and temporal) approaches. The contextual approach does not clearly separate exploration from exploitation, and it is employed when a certain degree of freedom to explore and exploit exists, which is mainly visible at the individual and group levels. The structural approach is visible when a clear structural allocation of exploration and exploitation to BUs at the organizational level is evident. When there is a complementary partnership with a partner having an explorative activity dominance and another partner with an exploitative activity dominance, ambidexterity is achieved at the interorganizational level following the structural approach. The sequential approach is more feasibly practical at the higher level, which is at the organizational and interorganizational levels when there is a temporal separation between the exploration and exploitation phases.

We note the model implicitly suggests the lower the analysis level, the higher the number of units are expected. This means in the context of a dual relationship between only two organizations, the number of individuals involved affecting the macro-social phenomenon is high.

## 5.5. Enriching the empirical contexts of multilevel ambidexterity studies

### 5.5.1. Conducting replication studies

Before we embark on new empirical contexts, it is essential to corroborate previous findings. Many of the papers considered in our SLR mentioned the need for future study to replicate their results and corroborate their findings. This way, studies can be reproduced and extended to additional analysis levels with a larger sample of companies while considering different contexts (underresearched industries and/or countries). Replication studies generally provide two types of contributions: (a) a theoretical contribution of strengthening past results by adding a slight variation in the research design and (b) a practical contribution of specific managerial insights about how ambidexterity is reached at each analysis level.

### 5.5.2. Conducting multilevel ambidexterity studies in SMEs

Diversifying the type of firms studied is another way to enrich our current knowledge of multilevel ambidexterity. From our SLR, we noticed company size is often a control variable, meaning organizational ambidexterity does not depend upon the number of employees in a company. Until now, numerous ambidexterity studies have focused research on multinational companies. For instance, Christofi et al. (2021) examined and reviewed 26 studies on the microlevel of ambidexterity in multinational enterprises. But relatively fewer studies investigate ambidexterity's microfoundation in small- and medium-sized enterprises (SMEs). We acknowledge only three studies are in our SLR sample: Ajayi, Odusanya, and Morton (2017), Kiss et al. (2020), and Venugopal et al. (2020). But Statista (2022) estimates the number of companies worldwide at 333.34 million in 2021, of which 99.90% are SMEs with fewer than 250 employees. Moreover, SMEs have significantly fewer resources and capabilities than multinational enterprises (MNEs); therefore, the risk of bankruptcy is more pronounced. So far, few scholars have studied small companies, even though ambidexterity could enable them to survive in the short run and grow in the long term. Thus, to ensure the generalization of the findings from empirical studies on multilevel ambidexterity, small businesses should no longer be neglected.

We further argue multilevel ambidexterity studies on SMEs could provide vital theoretical contributions regarding the evolution of firms' exploration and exploitation during different growth periods. For instance, individual ambidexterity may be more crucial in the start-up phase when only one or a few people seek growth. For SMEs, we suspect interorganizational ambidexterity could be more prominent than other ambidexterity levels because strategic partnerships complement internal capability. Once the company reaches a sufficiently large size, organizational ambidexterity can be achieved thanks to an appropriate structure enabling exploitation and exploration, for example, by dividing into several business units. We encourage further studies on the impact of size on multilevel ambidexterity. Undertaking them would offer practical implications to entrepreneurs and CEOs, who must manage ambidexterity in various firm sizes, depending on their resources, structures, and processes, according to the firm's industry.

### 5.5.3. Conducting multilevel ambidexterity studies in unconventional industries

Besides studies on company size, our SLR highlights various trends in the choice of empirical settings and, more precisely, in the selection of industries. We observe from the industry classification analysis (Appendix 2), some industries are studied more than others: the public sector, service industry, IT, and biotechnology are the four that predominate. Regarding the levels of analysis examined, (besides the industry) we notice ambidexterity is investigated across hierarchical levels in the service industry (Glaser et al., 2015; Mom et al., 2019; Swart et al., 2019) and from the interorganizational lens in the biotechnology industry (Karamanos, 2012; W. Li & Wang, 2019; Pereira et al., 2021; Russo & Vurro, 2010). The industry type, such as the service and biotechnology industries, affects the choice of the analysis levels uncovered by the researchers.

From our SLR on multilevel ambidexterity studies, we note the increasing popularity of studying innovation-intensive industries. But like Pertusa-Ortega et al. (2020), we found no publication on ambidexterity in non-innovation–intensive industries, such as the tourism industry. Moreover, agriculture, real estate, logistics, and transportation are not investigated in multilevel ambidexterity. Our expert survey highlighted the need to conduct further research in the following industries: agriculture and forestry, education, water supply, waste management, and professional, scientific, and technical activities.

Extending our SLR to some comments received during our expert survey, we note tensions can be industry specific. In agribusiness, the debates should not be restricted to the dichotomy of exploration versus exploitation. It can be further expanded to industry-specific challenges, such as how agribusinesses can mitigate versus adapt to climate change. Therefore, and in line with Hughes et al. (2020), we call for more research on firms from unconventional industries, meaning those which are less technological, innovative, or R&D intensive. Such replication would enable corroborating or refuting past findings and permit a more-thorough understanding of the boundary conditions of past studies (Jansen et al., 2016).

### 5.5.4. Conducting multilevel ambidexterity studies in developing countries

According to our SLR, most ambidexterity studies are conducted in Europe and focused most on UK firms (Ambos et al., 2008; Stokes et al., 2019; Swart et al., 2019). Studies have also been conducted in Taiwan and the United States (Y. C. Chang, Yang, Martin, Chi, & Tsai-Lin,

2016; Chen & Kannan-Narasimhan, 2015). Although several studies have been conducted in Asia (J. Y. Lee et al., 2017; J. Y. Lee et al., 2020), South American, African, and Arabian countries are rarely investigated by researchers, except for Ajayi et al. (2017), who encouraged future research to corroborate findings in SMEs from countries other than Nigeria. Few studies have covered multiple countries or a specific activity sector at the global level despite the research call initiated by Lavie et al. (2010). We argue studying countries the least represented in academic research, such as developing countries, would reveal the boundary conditions of cultural dimensions across organizational levels.

When considering the empirical setting, location and cultural dimensions may affect ambidexterity across the levels of analysis (interorganizational, organizational, BU, team, and individual). Culture may affect the level of ambidexterity in various ways. When a company has international employees, culture may moderate individual and team ambidexterity. When a company has business units in foreign countries, culture may moderate organizational ambidexterity. Moreover, when a company develops relationships with foreign partners, culture may moderate interorganizational ambidexterity. As per J. Y. Lee et al. (2020), we call for further research on the potential moderating effect of culture on multilevel ambidexterity.

Future research could also investigate whether the relationships found in previous studies, such as between empowerment and organizational ambidexterity, are driven by cultural characteristics (Y. Y. Chang, 2016). We possess scant knowledge about how cultural traits affect ambidexterity at the microlevels of analysis. Future research could also investigate the role of religion and other country-specific characteristics on micro ambidexterity's antecedents at the individual level (Christofi et al., 2021). As per recommendations from scholars like Kiss et al. (2020) and J. Y. Lee et al. (2020), we call for further research on the role played by cultural characteristics at different levels of analysis on exploration and exploitation. Replicating and expanding research in developing countries considering cultural characteristics would strengthen the generalization of past findings.

# 6. Conclusion

Our article contributes to a more thorough understanding of past ambidexterity literature and reinforces ambidexterity's theoretical knowledge foundation by using multilevel perspectives in several ways. First, we offer a synthesis of extant findings from our expert survey and SLR; these provide a clear overview of the state of research on ambidexterity's multilevel nature. Our study shows the original concept of ambidexterity Duncan (1976) and March (1991) developed has evolved toward different kinds of tensions and a search for paradoxical equilibrium. This comprehensive overview of ambidexterity contributes to the literature by proposing a multilevel and multiapproach framework that conceptualizes the antecedents, context, and outcomes concerning ambidexterity.

Second, our findings differ from those identified by nine published review papers. Our analysis explains how the centers of interest of existing multilevel ambidexterity contributed to the literature regarding ambidexterity's theories, methodologies, measurements, research contexts, antecedents, and approaches. Thanks to the focus on multilevel studies, this SLR contributes to previous reviews by depicting what has and has not been studied at the multilevel so scholars can move forward with the proposed research agenda.

Third, we contribute to the growing field of multilevel ambidexterity. Our paper contributes significantly to Raisch and Birkinshaw (2008a) and Simsek (2009) by providing an overview of ambidexterity using five levels of analysis: individual, team, business unit, organizational, and interorganizational. Our research contributes to Hitt et al. (2007) by further depicting the ambidexterity organizational paradigm nested in different management systems. We have highlighted diverse nested arrangements using cross-level interactions.

Fourth, we contribute to the field of multilevel ambidexterity by proposing a challenging research agenda in mobilizing a broader range of theoretical foundations using the correct set of constructs at the right level of analysis, deep-diving into the specificity of each analysis level, connecting the different analysis levels by privileging the causation effect, and investigating the novel empirical setting, such as the firm type, industry, and country.

This article has some limitations. We only considered articles written in English, which prevented us from examining studies published in other languages that could have investigated specific empirical contexts. In addition, most articles on ambidexterity focus on organizational

ambidexterity. This focus is understandable in management, but it has received criticism for being too narrow because adopting a piecemeal view fails to consider ambidexterity's multilevel nature (Chandrasekaran et al., 2012). Thus, we call for more research on the multilevel perspective of ambidexterity. We do highlight several fundamental questions that must be addressed while studying ambidexterity's in-depth complexity. A central objective of multilevel studies is not only to reflect on cross-level interactions, dynamics, and synergies between the levels of analysis at large but also to perform a more fine-grained analysis of the antecedents, ambidextrous levels, and outcomes. This SLR draws on the profile of past studies to suggest replication and extension in specific areas, such as in small and young companies, unconventional or low-innovative industries, and continents like Africa or South America. Finally, future multilevel studies could further contribute to the temporal approach and evolution of organizational ambidexterity to complement the current state of the extant ambidexterity literature.

# CHAPTER 2

## An Empowerment Climate's Central Role in Individual and Organizational Ambidexterity — Evidence from Agribusiness

## Abstract:

This study focuses on multilevel ambidexterity — at the individual and organizational levels — in agribusiness. To that end, 212 valid pairs of CEOs' and employees' responses were collected during the international agriculture show in Paris. The results from structural equation modeling show that an organizational empowerment climate plays a central role, fully mediating the relationship between individuals' knowledge inflows and individual ambidexterity and the relationship between connectedness and organizational ambidexterity. This article's contributions are threefold: it enriches the multilevel ambidexterity studies by focusing on the individual and organizational levels, it expands the ambidexterity literature by highlighting the role of the empowerment climate as a pivotal mediator, and it offers managerial insights for companies to address organizational dilemmas in agribusiness through an organizational empowerment climate.

**Keywords:** Ambidexterity, multilevel, innovation, empowerment climate, agribusiness

# 1. Introduction

Organizational ambidexterity has been studied extensively in past years to clarify how companies manage conflicting objectives through exploitation and exploration (T. Kim & Rhee, 2009; Tarba et al., 2020). Exploitation activities comprise using, expanding, or improving existing information, skills, goods, or processes (Lennerts et al., 2020; Raisch & Birkinshaw, 2008a). Exploration involves seeking and acquiring new knowledge that may offer new business avenues for the organization (Gupta et al., 2006). Exploitation is advantageous for short-term profitability, while exploration is a source of investment for achieving long-term profits (O'Reilly & Tushman, 2013). Recently, studies have gained depth by considering a multilevel perspective to help managers and decision-makers to focus their efforts in the right areas to improve performance.

The relevance of studying ambidexterity is that organizations able to manage dilemmas outperform others in survival and growth (Andriopoulos & Lewis, 2009). In addition to this scientific interest lies a practical enthusiasm to know how ambidexterity can be initiated and managed in organizations (O'Reilly & Tushman, 2004). The theoretical concept of organizational ambidexterity is now well understood and considered mature. Since March indicated that "finding an appropriate balance is made particularly difficult by the fact that the same issues occur at levels of a nested systems – at the individual level, the organizational level, and the social system level" (1991, p. 72), scholars have started investigating its micro-foundations, the lower levels of ambidexterity (including business unit, group, team, and individual levels). For instance, past studies have highlighted that ambidexterity's positive effect on performance becomes less important as the object of analysis becomes smaller: the positive effect will be strong and significant at the firm level but weaker and less significant at the unit or team level of analysis (Junni et al., 2013). However, most multilevel ambidexterity studies do not use the appropriate scales for measuring ambidexterity at multiple levels.

Multilevel studies imply examining (to varying extents) the individual and collective scales together (Simsek, 2009b). In this line of research, some scholars have found a positive relationship between individual characteristics and organizational ambidextrous behavior. Whereas some scholars have argued that CEO transformational leadership fosters organizational ambidexterity (C. R. Li et al., 2015), others have considered operational managers as influential individuals (Mom et al., 2019) or even ambidextrous employees who

favor organizational ambidextrous learning (Prieto-Pastor & Martin-Perez, 2015). And this suggests that both levels of analysis should be studied together to unveil the potential interactions between the individual and organizational levels of ambidexterity.

We know that ambidexterity leads to higher performance, but not whether the microfoundational view of ambidexterity takes over the organizational capacity to balance exploration and exploitation. There are still some debates surrounding whether individual ambidexterity is necessary for enhancing higher individual performance or as a condition for developing organizational ambidexterity. We argue that the different units of analysis are studied in silos, with a little effort dedicated to looking at interactions and effects across individuals at the organizational level. And we do not know which level of action is the most crucial for organizational performance.

Organizational ambidexterity and agribusiness industry performance are at stake. Historically, innovation was restricted to a limited number of stakeholders in agribusiness. However, nowadays, that is not the case. Innovation comes from all actors (including farmers and producers) and requires ambidexterity. From a multilevel perspective, the agribusiness industry comprises mainly small and medium-sized companies with a limited number of employees managed by a CEO. With limited resources, we observe that employees may assume several roles in an agricultural enterprise, which requires an effective empowerment climate and individual ambidexterity. Therefore, our study investigates the following research question: What is the role of an organizational empowerment climate in multilevel organizational and individual ambidexterity in agribusiness?

This study responds to the need for more studies on the interaction between ambidextrous individuals and ambidextrous organizations using a multilevel perspective, as encouraged by Mom et al. (2019). Moreover, our results show that an organizational empowerment climate fully mediates the relationship between individuals' knowledge inflows and individual ambidexterity and the relationship between connectedness and organizational ambidexterity. This article's contributions are threefold: it enriches the multilevel empirical knowledge by focusing on the individual and organizational levels, it expands the literature on ambidexterity by highlighting the empowerment climate as a full mediator, and it offers managerial insights for companies to deal with exploration-exploitation dilemmas through an organizational empowerment climate.

# 2. Theoretical background

## 2.1. Organizational ambidexterity

Organizational ambidexterity was coined by Duncan (1976) and refers to a company's ability to balance exploitation and exploration in its activities. Therefore, organizational ambidexterity comprises undertaking exploitative activities (which reinforce the depth of knowledge and capabilities) while simultaneously engaging in explorative activities (which expand the scope of knowledge and capabilities) (Junni et al., 2013; Tushman & O'Reilly, 1996). Exploitative activities focus on task efficiency, improving existing activities, reducing costs, and short-term production. Conversely, explorative activities involve a high-risk level, developing new activities, and experimenting to better react to future changes.

More specifically, exploration (March, 1991) or knowledge generation (Spender, 1992) is "the pursuit of knowledge, of things that might come to be known" (Levinthal & March, 1993, p. 105). It may provide long-term returns but is inherently uncertain (March, 1991). Explorative collaboration is critical for creating new organizational competencies (Faems et al., 2005). The emphasis is, therefore, placed on joint experimentation and learning (Koza & Lewin, 1998). And the primary concern is novelty rather than efficiency (Faems et al., 2005).

In contrast, exploitation (March, 1991) or knowledge application (Spender, 1992) is "the use and development of things already known" (Levinthal & March, 1993, p. 105). March (1991) opined that the "essence of exploitation is the refinement and extension of existing competencies, technologies, and paradigms" (March, 1991, p. 85). The focus is on leveraging existing skills (Koza & Lewin, 1998) and acquiring complementary knowledge to help develop existing technologies further (Teece, 1992). Exploitative collaboration primarily concerns enhancing existing organizational competencies (Faems et al., 2005).

Achieving an appropriate balance between exploration and exploitation activities is critical for organizational success (Katila & Ahuja, 2002; Tushman & O'Reilly, 1996). While Raisch (2008) argued that firms with a decentralized structure were more likely to pursue exploration than exploitation, most research suggests that internal routines favoring local search (Helfat, 1994), the modern focus on improving quality and efficiency metrics (Benner & Tushman, 2003), and an emphasis on short-term financial performance (Leonard-Barton, 1992) leads

firms to devote a disproportionate effort to exploitation (Rosenkopf & Almeida, 2003). Therefore, organizations that can achieve short-term and long-term outcomes (and therefore ambidexterity) can establish a competitive advantage over time (He & Wong, 2004; O'Reilly & Tushman, 2013).

Most existing studies have been conducted at the macro level and have well-documented the structures, methods, and processes that enable firms to explore and exploit simultaneously. However, Raisch and Birkinshaw (2008a) argued, "We would like to accentuate the need for studies spanning multiple levels of analysis…. Multilevel concepts and measures may be required to fully capture a firm's exploitation and exploration activities" (p. 397). Therefore, there is a need for further studies on multilevel ambidexterity using a micro-foundational approach.

## 2.2. Multilevel ambidexterity

Different organizational layers have been considered as the micro foundation of ambidexterity (Balarezo & Nielsen, 2022), such as the business unit (Birkinshaw & Gibson, 2004), group/ team (Jansen, Kostopoulos, Mihalache, & Papalexandris, 2016), and individual levels (Keller & Weibler, 2015). However, as March (1991) pointed out, "Finding an appropriate balance is made particularly difficult by the fact that the same issues occur at levels of nested systems—at the individual, organizational, and social system levels" (p. 72). Since March (1991), we argue that little has been done to fulfill the need for further multilevel studies. Still, we acknowledge the past contributions, such as the virtuous cycles of ambidexterity framework by Andriopoulos & Lewis (2009), the context-conduct-performance framework by Lavie, Stettner, and Tushman (2010), and an ambidextrous charter process by Zimmermann, Raisch, & Birkinshaw (2015).

García-Granero, Fernández-Mesa, Jansen, and Vega-Jurado (2018) encouraged further research on multilevel ambidexterity studies developed between individuals and organizations in particular. Pertusa-Ortega, Molina-Azorín, Tarí, Pereira-Moliner, and López-Gamero (2020) further supported the necessity for further studies studying micro and macro variables in particular. Analyzing ambidexterity using organizational and individual levels of analysis requires mobilizing different fields, such as strategic management and human resources management. To do so, Hitt, Beamish, Jackson, & Mathieu (2007) encouraged future multilevel

thinking by investigating corporate entities comprising nested arrangements because single-level studies are not sufficiently complex for capturing and understanding the antecedents of ambidexterity that can be nested in another level. We further argue that organizational ambidexterity is a complex phenomenon necessitating multilevel research design and level-specific contributions (Tarba, Jansen, Mom, Raisch, & Lawton, 2020).

Raisch and Birkinshaw (2008a) and Simsek (2009) emphasized that ambidexterity is an infused capability in the organization present in a cross-level part of a given organization. Therefore, studying its antecedents and outcomes requires empirical studies to consider those from all levels of a company and those impacting different levels. While Simsek (2009) initiated ambidexterity studies using individuals and organizations as two units of analysis, there is a need for further studies at the dual level — the individual and organizational levels — to understand the interaction between the two to complement Harris and Wood (2020) and Mom, Chang, Cholakov, and Jansen (2019) to provide further understanding of how ambidexterity can be managed at different organizational levels.

March (1991) explained that the search for a balance between exploration and exploitation is particularly challenging because the same issues arise at interlocking system levels — at the individual, organizational, and social system levels. Therefore, ambidexterity studies must address the complexity of multilevel reality in understanding the development of ambidexterity through multiple organizational levels. Given that ambidexterity is reflected at different organizational levels, organizational ambidexterity measures differ from individual ambidexterity measures. Related to this, Mom et al. (2019) pinpointed the scarcity of studies on multilevel top-down or bottom-up relationships through an integrated multilevel framework. Because existing studies have focused on organizational ambidexterity to study top management practices on aggregated individual outcomes or organizational outcomes, there is no clear link between individual-level ambidexterity and organizational-level ambidexterity.

However, one critical shortcoming of past studies is that few papers have measured ambidexterity with reliable scales at multiple analysis levels. The operationalization of the constructs is a fundamental challenge for the field. As per Turner et al. (2013), we argue that existing studies had difficulties adapting the scales to the focal level of analysis (Junni et al., 2013). Only Mom et al.'s (2019) study used the proper scales of ambidexterity at individual and

organizational levels, which remains very limited. There is a need for further quantitative studies using the appropriate scale for a specific analysis level. And most studies use one proper scale for one level of analysis and complement by a proxy on the other unit of analysis.

Following the micro-foundations movement in the field of strategy (Felin & Foss, 2005; Foss, 2011), increasing importance has been dedicated to the individual level of analysis. As Felin and Foss (2005) stated, "Organizations are made up of individuals, and there is no organization without individuals. There is nothing quite as elementary; yet this elementary truth seems to have been lost in the increasing focus on structure, routines, capabilities, culture, institutions, and various other collective conceptualizations in much of the recent strategic organization research" (p. 441). Foss (2011) stated that a firm's knowledge is controlled by a macro-orientation at the firm level. But he also asserted that generating, incorporating, and sharing knowledge depends critically on individuals' skills, efforts, knowledge, and behaviors. Therefore, ambidexterity can be identified at the organizational macro-level and the individual level (Raisch et al., 2009; Turner et al., 2013). Raisch et al. (2009) and Birkinshaw and Gupta (2013) further encouraged studying individual ambidexterity.

## 2.3. Individual ambidexterity

Bledow et al. (2009) defined individual ambidexterity as "a person's ability to execute conflicting activities and be able to change between different mind-sets and action sets" (p. 322). Tempelaar and Rosenkranz (2019) defined individual ambidexterity as an individual's ability to practice exploitation and exploration activities and identify synergies between them (Mom, Van Den Bosch, and Volberda, 2009; Rogan & Mors, 2014). Furthermore, individual ambidexterity may also be considered as an individual's behavioral skills to be involved in opposite functions (Smith & Tushman, 2005; Bledow et al., 2009; Miron-Spektor, Gino & Argote, 2011). Following previous studies (Bledow et al., 2009; Mom, Van Den Bosch, & Volberda, 2009), individual ambidexterity is considered a multidimensional construct referring to the degree to which individuals perform explorative and exploitative activities in their daily roles.

Individual exploitation covers diverse activities based on existing skills, assets, and knowledge. Exploitative learning increases knowledge depth, enhancing incremental development and increasing reliability (Benner & Tushman, 2003). Therefore, exploitation focuses on activities

that improve and strengthen existing competencies and emphasizes applying existing knowledge. In contrast, exploration covers acquiring new knowledge and capturing new opportunities (Benner & Tushman, 2003; Gupta, Smith, & Shalley, 2006; Jansen, George, van den Bosch, & Volberda, 2008).

Ambidextrous individuals must have sharply opposite values, contextual knowledge, and behavioral expectations that reflect the opposing demands of exploration and exploitation (Leavitt et al., 2012; Mom et al., 2009). Individuals may make trade-offs in organizing their daily agenda and operations to combine short-term and long-term objectives because of the challenge of combining conflicting tasks. As Gupta et al. (2006) pointed out, "It would be difficult for an individual to develop routines to excel simultaneously at both exploration and exploitation... [or] to even switch between routines of exploration and exploitation" (p. 19). Raisch, Birkinshaw, Probst, and Tushman (2009) argued that past studies have been able to analyze a person's ability to perform opposing tasks but not to explain why some people can while others cannot. And individual intangible resources are limited (March, 1991), restricting their capacity to develop enough skills in exploration and exploitation (Gupta et al., 2006; Ambos et al., 2008). Gupta et al. (2006) mentioned that "it would be difficult for an individual to develop routines to excel simultaneously at both exploration and exploitation... [or] to even switch between routines of exploration and exploitation" (p. 19).

Individual ambidexterity matters to organizational ambidexterity because individual ambidexterity may allow companies to merge exploration and exploitation (Adler et al., 1999; Miron-Spektor et al., 2011) and achieve synergies between explorative and exploitative activities at the organizational level. Other researchers have also identified individual ambidexterity as an organization's ability to monitor exploitation and exploration activities and examined the interactions that exist between these activities (Mom et al., 2009; Rogan & Mors, 2014; Tempelaar & Rosenkranz, 2019).

Many studies have stressed the individual's role in exploration and exploitation activities (Gibson & Birkinshaw, 2004; O'Reilly & Tushman, 2004; Cattani, 2006; Eisenhardt, Furr, and Bingham, 2010; Mors, 2010). However, research on how firms can induce or shape these behaviors at the level of the individual (Gupta et al., 2006; Mom et al., 2009; Raisch et al., 2009) is scarce. But a few studies exist. For instance, Lee and Meyer-Doyle (2017) contributed to the literature by suggesting that individuals are competent enough to participate in these

activities and switch between them depending on incentives (Gibson & Birkinshaw, 2004; Mom, Van Den Bosch, and Volberda, 2009). And they provided insights into how incentives motivate individuals to delve into new ideas or utilize existing ones (Lee & Meyer-Doyle, 2017).

Some of the considered antecedents of individual ambidexterity are tenure, knowledge inflows, formal and informal coordination mechanisms, motivation, cognitive and social abilities, and creativity and cognitive style (Mom, Van Den Bosch, & Volberda, 2007; De Visser & Faems, 2015; Kao & Chen, 2016; Gabler et al., 2017). Other factors, such as the type of individuals and the characteristics of individual jobs and industries, determine individual ambidexterity. For instance, "In the services field, firms look for employees who have the dual capacity of exploiting existing competencies in service encounter and exploring new sales opportunities" (Faia & Vieira, 2017, p. 448). Sok et al. (2016) also claimed that employees who directly interact with customers have a higher probability of increasing sales opportunities and completing service requests simultaneously.

Operational managers may conduct routine and nonroutine activities (Adler et al., 1999), fulfill administrative and entrepreneurial roles (Probst et al., 2011), and combine short- and long-term views (O'Reilly & Tushman, 2013). Therefore, it is a challenge that must be taken on in the best possible way to achieve exploration and exploitation at the level of operational managers. Mom et al. (2019) investigated the role played by operational managers in ambidextrous organizations. They argued that organizational ambidexterity is generated by combining separate yet similar forms and strategies in which operational managers integrate their exploratory and exploitative activities into broad organizational sources of creativity and decision-making. Moreover, Mom et al. (2019) found that an organization's strategic human resource (HR) management facilitates operational managers' ambidextrous behavior. And after looking at the information provided by analyzing 467 operational managers and 104 senior managers within 52 firms, Mom et al. (2019) concluded there needs to be a balance between the motivation that HR brings and the autonomy each individual has.

Individual ambidexterity has been studied for specific people, like top managers. Associates, team supervisors, operational level management, middle management, and top management have been investigated, occupying higher organizational levels because their higher experience and autonomy greatly matter to individual ambidexterity (Mom et al., 2009). Therefore, past

studies have been limited to the focus on the ambidexterity of managerial employees (Mom, Van Den Bosch, and Volberda, 2009; Rogan & Mors, 2014). But a different situation is presented with non-managerial employees, who cannot achieve ambidexterity by assigning and managing resources among various employees working on either exploration or exploitation. Birkinshaw and Gupta (2013) further argued that focusing only on managers is too limited. They also noted that "Even the most ordinary production worker or call center worker faces some version of the ambidexterity dilemma: how much of my time should I spend exploiting my basic skills for the benefit of the organization, and how much should I try to develop new skills and/or help the organization in creative ways?" (p. 294). Therefore, we argue that there is a need for more studies on the ambidexterity of employees without managerial positions and the balance between HR motivation and the individual degree of autonomy and empowerment.

## 2.4. An empowerment climate as an antecedent of ambidexterity

Multilevel ambidexterity's antecedents require further studies to identify the internal mechanisms that catalyze individual and organizational ambidexterity. Under stress conditions, employees may be willing to specialize in a domain they master most — in exploitation — to avoid risking uncertain gains from exploration and provide efficient outputs. Therefore, individual ambidexterity requires people to have sufficient freedom to conduct their daily operations while investigating new avenues. Ambidexterity is (by definition) related to innovation, requiring individual openness to navigate outside the comfort zone. Such openness — a fundamental aspect of organizational climate — is not taken for granted and may vary substantially from company to company. The company should offer a favorable environment and a friendly climate — such as by providing a fruitful empowerment climate — to nurture individual ambidexterity, therefore strengthening organizational ambidexterity. The current literature pinpoints the need for additional research to investigate the predictors and outcomes of an organizational empowerment climate and how it may contribute to multilevel ambidexterity (Han et al., 2020).

Scholars have employed the concept of empowerment to study the innovation-friendly context, which has also helped them to elucidate the effective functioning of organizations (Conger & Kanungo, 1988). Psychological empowerment, as posited by Spreitzer (1995), contributes to managerial effectiveness and fosters innovative behavior. Actors with significant control over others can change or surrender some of that control so that others can act (van Baarle et al.,

2021). Based on this rationale, an empowerment climate appears as a condition or predictor of organizational effectiveness and innovation. Empowering resonates with enabling. However, enabling places less emphasis on power and focuses more on creating conditions for motivating actions. Empowerment involves enhancing positive perceptions and self-efficacy among members within an organization and, therefore, may encourage individual ambidexterity conducive to organizational ambidexterity.

Because an empowerment climate is intangible and based on individual perception, it shares similarities with trust. But both have distinct characteristics and effects within organizations. Trust typically involves specific relationships between individuals or entities, such as a dual relationship. For example, employees might trust their immediate supervisor to support and guide them in their work, or customers might trust a company to deliver high-quality products or services. Trust is often built through repeated interactions and experiences that establish confidence and reliability. An increased trust and reduced control over employees increase employees' autonomy at work (Outila et al., 2021). Such autonomy at work influences individual ambidexterity, as people would be more likely to explore new paths to maintain their productivity on more recurrent activities.

Unlike trust, an empowerment climate has a more diffusive and collective impact on individuals within a community, team, or company. It refers to the overall atmosphere or perception of empowerment people feel within an organizational context. Rather than being directed toward specific individuals or objects, an empowerment climate encompasses a broader sense of empowerment diffused in the organizational culture that catalyzes the sense of autonomy, ownership, and control over employees' work. Individual opinions are valued, and each individual has the authority to make decisions and take initiative. And this collective feeling of empowerment fosters a supportive and collaborative environment where individuals are motivated to contribute their ideas and efforts toward achieving shared goals. While trust is often specific and focused on particular relationships or entities, an empowerment climate influences individuals more broadly within a community or organization. It sets the tone for how power and decision-making are distributed and shapes employees' perceptions of their capabilities, influence, and the overall fairness of their work environment. Trust and an empowerment climate are crucial for organizational effectiveness because trust helps build positive relationships and enhance collaboration, while an empowerment climate enables individuals to feel engaged, motivated, and committed to their work.

We can assume that an organizational empowerment climate is part of participative management, where leaders share power with their subordinates (Conger & Kanungo, 1988). Empowering employees goes hand in hand with individual involvement, social ties, and information sharing (Alexiev et al., 2020). As per Zimmerman (1990), we argue that empowerment is crucial at an individual level and an organizational one — influenced by environmental context (social, political, cultural) — and is, therefore, meaningful in studying multilevel ambidexterity. And an empowerment climate differs significantly from a large firm to a small one and depends on the industry type.

## 2.5. Multilevel ambidexterity empirical contexts

While conducting multilevel studies on ambidexterity, we note that some organizational types have been studied more than others. Most existing studies have been conducted in multinational companies (See Christofi et al. (2021) for a review of 26 studies on the micro level of ambidexterity in multinational enterprises). Unfortunately, studies on multilevel ambidexterity in small and medium-sized enterprises (SMEs) are rare. But we acknowledge three empirical studies: Ajayi, Odusanya, and Morton (2017), Kiss et al. (2020), and Venugopal et al. (2020). Therefore, the generalization of findings based primarily on multinational multilevel ambidexterity remains limited. Studying SMEs is critical because, unlike multinational enterprises (MNEs), they have limited resources and capabilities. Individuals play a significant role in SMEs because one person can hold several functions. Ambidexterity could enable SMEs to increase their likelihood of survival in the short run and grow in the long term. Therefore, further studies should be conducted to further generalize past multilevel ambidexterity findings and help SMEs survive and flourish.

We also note that some industries have been more studied than others. For instance, the public sector, service industry, IT, and biotechnology have been investigated most frequently. Therefore, we argue that mainly innovation-intensive industries have been studied, while non-innovation–intensive industries have not been investigated with the same energy, as Pertusa-Ortega et al. (2020) argued. Moreover, agriculture, real estate, logistics, and transportation are not investigated in multilevel ambidexterity, which constitutes a critical empirical gap. For instance, in agribusiness, additional debates are currently discussed in addition to the exploration–exploitation paradox. For example, climate change mitigation and adaptation also constitute a critical dilemma for farmers. Echoing Hughes et al. (2020), we argue that there is

a need for further studies in industries characterized by a lower level of technology, R&D, and innovation (such as agriculture) to confirm — or not — past findings and further discuss the boundary conditions of past studies (Jansen et al., 2016).

# 3. Hypotheses development

## 3.1. Individual and organizational ambidexterity

Regarding individual and organizational levels of ambidexterity, we seek to define whether and how individuals can extend their knowledge and learn new skills to contribute to organizational ambidexterity. The literature presents divergent points of view on this debate. Gupta et al. (2006) supported that individuals focus commonly on exploration or exploitation, implying that it is easier for larger entities to explore and exploit simultaneously than for smaller companies, where few individuals should develop appropriate routines to deal with a high level of both activities. Gupta et al. (2006) further argued that ambidextrous responsibility can be assigned to a higher-level system (the organizational level) so that each individual from lower-level systems (units or departments) can focus solely on exploration or exploitation without serious threat to long-term performance.

And switching from exploration to exploitation adds another difficulty to individual ambidexterity, which explains why most individuals may not be able to develop ambidextrous behavior. Individual specialization is naturally less complex than individual ambidexterity but is not an obstacle to organizational ambidexterity in medium and large companies (Gupta et al., 2006). In a more nuanced way, we see that ambidexterity can also happen across levels of analysis. At the macro level, such as the organizational level, learning may occur because of individuals' differences (Gupta et al., 2006). The micro level is not always aligned with the macro consequences when considering individuals and organizations as two stakeholders of an innovation process. For instance, a farmer searches for and learns a new method to treat a plant's disease naturally, but their organization may exploit this discovery for profit. Therefore, exploration initiated by an employee may be followed by their organization's exploitation.

On the other hand, several studies have considered individuals as nested units of the organizational environment influenced by macro-parameters (Mom et al., 2009; Raisch et al., 2009; Rogan & Mors, 2014). And this means that all nested organizational units are interrelated, and individuals are integrated parts of organizations affected by internal and external factors. For instance, Rogan & Mors (2014) argued that networks shape individual behavior so that exploration and exploitation result from social interactions, individual learning, and

organizational constraints that shape individual behavior. Related to this point, the microfoundation theory suggests that bottom-up processes and characteristics result in higher-level outcomes, which explains the determinants and processes that create collective phenomena (Felin et al., 2012). Based on Rogan & Mors (2014) and Mom et al. (2019), we argue that macro-level ambidexterity is created by the aggregation of individuals' exploratory and exploitative behaviors and their capacity to achieve high levels of exploration and exploitation.

Our multilevel research framework implies that individual ambidexterity contributes to the development of organizational ambidexterity. Based on the microfoundation approach of ambidexterity, we suggest that:

*Hypothesis 1: Individual ambidexterity relates positively with organizational ambidexterity.*

## 3.2. Environmental dynamism and organizational ambidexterity

Exploration and exploitation are two fundamental activities leading to organizational ambidexterity when combined or balanced at similar levels. When studying organizational ambidexterity, environmental conditions are commonly analyzed contingencies (Jansen et al., 2006; Luger et al., 2018; Uotila et al., 2009). Environmental dynamism is the frequency of unplanned changes in the organization's environment (Dess & Beard, 1984), which can be related to market demands, technological disruptions, or managerial changes. Studies have often supported that external environmental conditions are crucial levers for developing firms' behavior (Aldrich, 1979; Volberda & Van Bruggen, 1997). Environmental contingencies may affect an organization's ability to behave ambidextrously because dynamic environments often prompt organizations to explore as they realize that market changes are gradually making their existing products and services obsolete (Jansen et al., 2005; Sorensen & Stuart, 2000).

Moreover, when the environment is considered dynamic, senior executives ask for more recommendations to answer the increased requirements for handling information (Alexiev et al., 2020). Industry conditions can lead to an unbalanced level of exploration and exploitation. And a highly dynamic environment can lead to negative consequences of adopting overly exploitative strategies (H. Wang & Li, 2008). Contributing to this result, Fu et al. (2022) found that environmental dynamism positively moderates the relationship between distributed

leadership and organizational ambidexterity. When competing in a highly dynamic environment, companies may need to keep a high level of exploration to stay ahead of their competition while constantly exploiting and improving their existing processes to increase efficiency. Thus, we argue that the frequency of environmental changes in terms of needs and demand is linked to the organization's levels of exploration and exploitation. We posit that:

*Hypothesis 2: Environmental dynamism relates positively with organizational ambidexterity.*

## 3.3. Individuals' knowledge inflows and individual ambidexterity

Individuals' knowledge inflows are how individuals receive knowledge. Based on Mom et al.'s (2007) study, we differentiate between different types of knowledge inflows. There are bottom-up flows from lower-hierarchy-level colleagues, horizontal flows from peers, and top-down flows from higher-hierarchy-level managers. High individual knowledge inflows mean that individuals (such as employees, managers, or senior executives) receive substantial knowledge from other employees, regardless of their hierarchical positions. As a condition for individuals to explore, we know that the content of knowledge inflows must not be redundant (Fang et al., 2010). Some scholars have attempted to find the individual antecedents of exploration and exploitation.

For instance, Lee (2019) supported that spatial proximity (when an employee's office is moved closer to his peers' offices) favors individual-level exploration. Indeed, spatial proximity also implies that employees can easily communicate face-to-face during working hours. Hence, employee proximity potentially enhances knowledge exchange. Based on past studies, we assume that individual exploitation is possible thanks to essential knowledge for running daily tasks that must be fast and efficient. Related to this, Mom et al. (2007) suggested that knowledge inflows from lower-level colleagues favor exploitation activities while knowledge exchange between peers stimulates individual exploration. We argue that because individuals receive high levels of knowledge from other colleagues (top-down and bottom-up), they will be more involved in exploration and exploitation activities to contribute to their peers' knowledge with a sense of collective involvement. We hypothesize the following:

*Hypothesis 3: Individuals' knowledge inflows relate positively with individual ambidexterity.*

## 3.4. Individuals' knowledge inflows and an organizational empowerment climate

Regularly receiving substantial knowledge from colleagues may not be feasible in an organization due to workplace tensions. Organizational conditions, such as informal empowerment, are considered a strategic strength where psychological safety is shared by individuals (Maynard et al., 2012; van den Berg et al., 2021). Empowerment initiatives are often taken based on the assumption that individuals share responsibility in the decision-making process of how activities are conducted to reach common objectives (Maynard et al., 2012).

When considering the organizational structure of nested relationships, individuals' knowledge inflows is an individual-level variable because it concerns employees' characteristics. But a company's empowerment climate can be studied as an organizational-level variable when it relates to the shared conditions where employees work collectively (Molina-Azorín et al., 2020; Seibert et al., 2004). Moreover, van den Berg et al. (2021) found that an empowerment climate somewhat relates with psychological safety, with interpersonal relationships representing a safe zone for individual risk-taking. Because the notion of collective sharing is crucial in developing a company's empowerment climate, we hypothesize that:

*Hypothesis 4: Individuals' knowledge inflows relate positively with an organizational empowerment climate.*

## 3.5. The mediating role of empowerment climate on individual ambidexterity

As hypothesized, there are good reasons to think that individuals' knowledge inflows and individual ambidexterity relate positively. Although the direct effect between individuals' knowledge inflows and individual ambidexterity seems possible, we argue that individual ambidexterity will be developed mainly through an organizational empowerment climate.

An empowerment climate is a relational construct that highlights relative power between employees. In van den Berg et al.'s (2021) case study, we note the positive effects of an empowerment climate on individual engagement (such as active involvement, decision implementation, and motivation). And this complements Alexiev et al. (2020) findings, which

show that empowered executives can consider new options while discussing serious issues. An empowerment climate creates a context of confidence for lower-level employees and higher-level managers (Alexiev et al., 2020). A high level of empowerment climate implies that employees know their organization favors autonomy, taking initiative, accountability for actions, and knowledge sharing. And to regulate such a climate, each individual is encouraged to become self-regulated, self-monitored, and self-endorsed (Seibert et al., 2004). Ahuja & Thatcher (2005) highlighted a positive relationship between a component of empowerment climate (autonomy) and individual willingness to innovate in IT. This link has been extended and contradicted by Maruping & Magni (2012), whose results demonstrated no significant relationship between team empowerment climate and individual exploration.

Autonomy and independence imply that employees are free to organize their working time and schedule their tasks as they prefer. For instance, an employee can dedicate time to learning a new technical skill. Sharing knowledge is associated with curiosity, which may lead to new ideas due to individual exploration. We argue that individual ambidexterity can be achieved by integrating new knowledge. Employees can manage exploitation and exploration in their work activities when empowered.

In light of those arguments emerging from the literature, we posit that an organizational empowerment climate is a fundamental antecedent of individual ambidexterity so that:

*Hypothesis 5: An organizational empowerment climate mediates the relationship between individual knowledge inflows and individual ambidexterity.*

## 3.6. Connectedness and organizational ambidexterity

Regarding the organizational context that includes communication, HR practices, leadership, and organizational culture, Zhang et al. (2022) argued that companies' contextual factors should be considered as a determinant of exploration and exploitation efforts. Since connectedness refers to "the degree of formal and informal direct contact among employees across departments" (Jaworski & Kohli, 1993, p. 56), it plays a role in the interpersonal exchange between employees. Connectedness favors the exchange of information that can be converted into knowledge. According to Fu et al. (2022), connectedness correlates with distributed leadership and organizational ambidexterity. Thus, we argue that because an organization can have a high level of internal exchange, it can be expected that a company's connectedness

favors organizational exploration and exploitation. In this organizational context, all employees can refine companies' processes and products while innovating thanks to mutual learning emerging from their connections. Therefore, we derive the following hypothesis:

*Hypothesis 6: Connectedness relates positively with organizational ambidexterity.*

## 3.7. Connectedness and an organizational empowerment climate

Connectedness is expected to relate with collective social phenomena such as an organizational empowerment climate. Previous research suggests that connectedness among employees facilitates the exchange of knowledge and information, leading to improved knowledge intelligence within the organization (Jaworski & Kohli, 1993). A high level of connectedness within an organization fosters an environment of open and secure communication, regardless of employees' hierarchical responsibilities. These employees can share common perceptions of practices, policies, and habits (Maruping & Magni, 2012). Because connectedness relies on the closeness between employees for them to engage in interpersonal links, it can be expected that the connections between employees positively affect an organizational empowerment climate, hence:

*Hypothesis 7: Connectedness relates positively with an organizational empowerment climate.*

## 3.8. An organizational empowerment climate and organizational ambidexterity

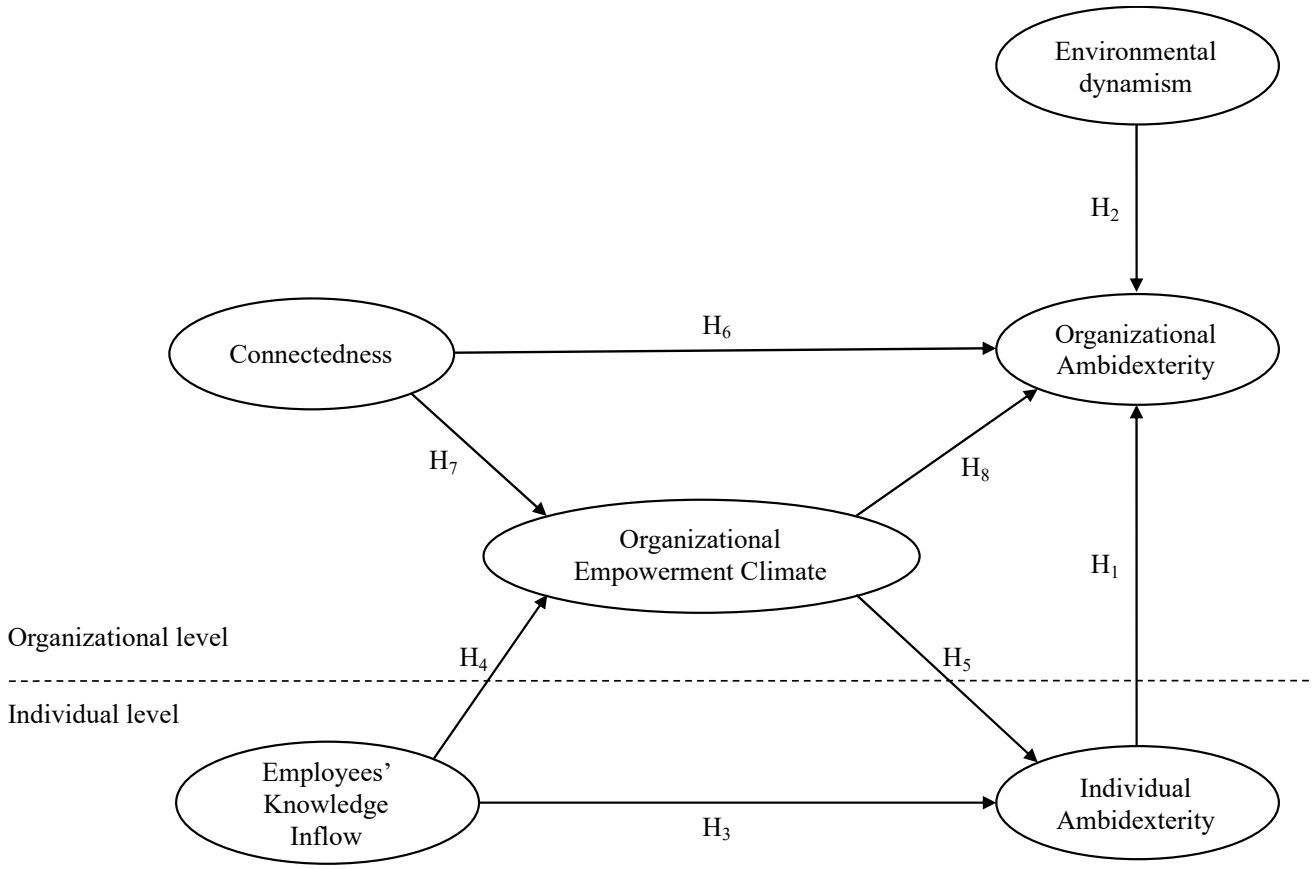
An organizational empowerment climate is widely recognized for its positive effects on organizations. As Seibert et al. (2004) demonstrated, an empowerment climate results from people's confidence in their abilities and decision-making capabilities. Collectively-shared empowerment is crucial because, in such a climate, individuals have self-confidence and the power to create complex tasks (P. Sok & O'Cass, 2015). And this empowerment has been shown to impact organizational ambidexterity positively (Seibert et al., 2004; P. Sok & O'Cass, 2015). However, this finding has been largely nuanced by Maruping & Magni (2012), who found that an empowerment climate did not significantly impact the firm's intention to explore new opportunities and, thus, had no significant effect on the ambidexterity.

Considering the interplay between connectedness, an organizational empowerment climate, and organizational ambidexterity, we aim to examine organizational empowerment's mediating role. In an empowerment climate (where all employees are free to make decisions), we expect that organizations will be more equipped to manage the inherent tensions between exploration and exploitation. And this is because the shared sense of collective responsibilities among all employees may facilitate organizational outcomes that initially appear conflicting. Therefore, we hypothesize the following:

*Hypothesis 8: An organizational empowerment climate mediates the relationship between connectedness and organizational ambidexterity.*

Our study investigates the research model shown in Figure 5, derived from the literature on organizational ambidexterity and strategic management.

Figure 5 : A Multilevel Integrated Research Model



# 4. Methodology

## 4.1. Questionnaire development

We used a survey research design and collected data from 212 valid pairs of questionnaires completed by companies and employees working in agricultural-related activities to test the developed hypothesis. Our questionnaire was developed through a multi-stage process (Anderson & Gerbing, 1988; Churchill, 1979; Hazan & Shaver, 1994; Hazan & Zeifman, 1999). We adapted the scales from the literature to build our draft questionnaire, which was subsequently evaluated by two academic experts in innovation management and two practitioners. Based on the questionnaire's critical evaluation, we simplified some items in our constructs to speed up the response process. Two questionnaires were designed: one for the employees (individual level) and another for the CEO (organizational level). Different variables were assessed depending on the questionnaire's analysis level.

We measured six reflective constructs comprising 42 items. Regarding the individual-level questionnaire, knowledge inflows, individual ambidexterity, and all the individual control variables were assessed by employees. We used the eight-item adapted scale from Gupta & Govindarajan (2000) and used by Mom et al. (2007) to capture the individual knowledge inflows. Individual ambidexterity was computed as the multiplication of exploitative activities by explorative activities using a 14-item scale adapted from Mom et al. (2007) and used by Rosing & Zacher (2017). Regarding individual ambidexterity, we controlled for gender, age, position, education level, tenure in the company, tenure in the industry, and individual salary.

Regarding the organizational-level questionnaire, empowerment climate, connectedness, organizational ambidexterity, environmental dynamism, and all the organizational control variables were assessed by CEOs. Connectedness was measured through a five-item scale adapted from Jaworski & Kohli (1993) and used by Fu et al. (2018). We used the adapted scale from Seibert et al. (2004) to measure empowerment climate. This scale was also used by Chang (2016). We computed the multiplication of the exploratory orientation by the exploitative orientation from the adapted 12-item scale from Lubatkin et al. (2006) to assess organizational ambidexterity. Finally, environmental dynamism was measured based on the scale of Dill (1958) and Volberda & Van Bruggen (1997). This scale was used by Jansen et al. (2006). We used 11 control variables: sales revenue, debt, mean salary, margin rate, subvention, log of the

number of employees, years since creation, type of activity, country, family business, and company legal status. Because the data collection was conducted in France in a French-speaking context, the items of both questionnaires were developed in English from the literature, translated into French, and back-translated into English by an independent translator unfamiliar with the original questionnaire (Brislin, 1970). The questionnaires were then compared to ensure the content remained unchanged.

Ambidexterity comprises inseparable measures of exploitation and exploration (Floyd & Lane, 2000). Following Birkinshaw & Gibson (2004), we measure individual and organizational ambidexterity by multiplying their respective levels of exploration and exploitation. Organizational ambidexterity is visible in companies operating in the agricultural industry. For instance, in a company called GFA Loobuyck (which produces potatoes), the farm is involved in exploitative activities: plowing his field (as usual) to reach higher production while testing new techniques or innovating in manufacturing La 76 potato chips. This former innovation-related activity refers to exploration because it requires investment where yield or performance is uncertain. Within this company, individual ambidexterity is also visible. Employees are particularly active in exploitative activities when they dedicate time to regular tasks using their expertise while also exploring new opportunities that could benefit the farm, such as those concerning business development and environmental transition, for example.

## 4.2. Data collection

The list of companies participating in the Salon International de l'Agriculture (International Agriculture Show) in Paris was analyzed by the authors before collecting data. Attracting hundreds of agricultural industry stakeholders annually, the Salon International de l'Agriculture presents and celebrates harvests from French soil. This major event (renowned worldwide) hosted about a thousand exhibitors and attracted 502,757 visitors in 2022. The best agricultural companies, individuals, and animals are rewarded with prizes for French excellence regarding their respective agricultural activities. One of this show's key aspects is that all regions of France are well-represented in the number of companies and specialties. This show is B2B and B2C friendly. Therefore, collecting data during the event was relevant to meet CEOs and employees from numerous companies operating in agribusiness.

From the total number of 782 exhibitors, we selected 339 relevant companies. Some firms did not engage in agri-food production or manufacturing. Therefore, we did not consider them relevant to our study. And public organizations, such as unions, media, regional or departmental committees, financial organizations, chambers of commerce or agriculture, training for farmers, political entities, administrative institutions, and entertainment exhibitors, were excluded. We selected our relevant companies when over 50% of their activities were related to agriculture.

All 339 relevant companies were asked to respond to our questionnaires. The questionnaires were administrated by the main author and six research assistants from February 26$^{th}$ to March 6$^{th}$, 2022, in Paris. The questionnaires were distributed in pairs (one survey to the CEO and another to their employee). When one of those two people (the CEO or the employee) was missing, we made an appointment with the missing informant later to ensure all the pairs were fulfilled.

Of 339 relevant companies, 173 companies agreed to contribute. In 28 companies, we had more than one employee responding. Therefore, several pairs could be created for a given company. We obtained 212 valid pairs (62% response rate) (Table 8). We used the organization (CEO response) and the individual (employee response) as our two units of analysis. The average values of the first 10% and 20% of respondents were compared with those of the last 10% and 20% of the respondents. No significant difference was detected between earlier and later respondents.

Table 8 : Descriptive statistics

| Dimension | Items | Frequency | Percentage |
|---|---|---|---|
| Gender | Female | 66 | 31.10 |
| | Male | 146 | 68.90 |
| Age | 18–24 | 33 | 15.6 |
| | 25–34 | 66 | 31.1 |
| | 35–44 | 42 | 19.8 |
| | 45–54 | 46 | 21.7 |
| | 55+ | 25 | 11.8 |
| Education | No diploma | 8 | 3.8 |
| | BTEC or GNVQ equivalent | 28 | 13.2 |
| | High school graduate | 36 | 17 |
| | Bachelor's degree | 92 | 43.4 |
| | Master's degree | 45 | 21.2 |
| | Doctorate | 3 | 1.4 |
| Job position | Intern or volunteer | 19 | 9 |
| | Employee | 54 | 25.5 |
| | Middle/high-level manager | 35 | 16.5 |
| | Senior manager | 10 | 4.5 |
| | Owner or CEO | 94 | 44.3 |
| Company tenure (years) | < 3 | 46 | 21.7 |
| | 3–5 | 51 | 21.4 |
| | 6–10 | 57 | 26.9 |
| | 11–20 | 36 | 17,0 |
| | 21–30 | 6 | 2.8 |
| | 31+ | 16 | 7.5 |
| Industry tenure (years) | < 3 | 36 | 17 |
| | 3–5 | 36 | 17 |
| | 6–10 | 55 | 25.9 |
| | 11–20 | 48 | 22.6 |
| | 21–30 | 20 | 9.4 |
| | 31+ | 17 | 8 |
| Salary (annual gross) | < 10k | 14 | 6.6 |
| | 10k–15k | 19 | 9 |
| | 15k–20k | 39 | 18.4 |
| | 20k–25k | 34 | 16 |
| | 25k–32k | 41 | 19.3 |
| | 32k–40k | 30 | 14.2 |
| | 40k–50k | 13 | 6.1 |
| | 51k+ | 22 | 10.4 |

N = 212

| Dimension | Items | Frequency | Percentage |
|---|---|---|---|
| Number of employees | < 3 | 57 | 26.9 |
| | 3–5 | 50 | 23.6 |
| | 6–10 | 42 | 19.8 |
| | 11–25 | 31 | 14.6 |
| | 26–50 | 8 | 3.8 |
| | 51+ | 24 | 11.3 |
| Years since the company's creation | < 3 | 11 | 5.2 |
| | 3–5 | 31 | 14.6 |
| | 6–10 | 37 | 17.5 |
| | 11–25 | 59 | 27.8 |
| | 26–50 | 41 | 19.3 |
| | 51+ | 33 | 15.6 |
| Status of company | Simplified joint stock company | 68 | 32.1 |
| | Limited liability company | 44 | 20.7 |
| | Individual company | 26 | 12.3 |
| | Single-person limited liability farming business | 23 | 10.8 |
| | Civil society of agricultural exploitation | 13 | 6.1 |
| | Agricultural grouping of exploitation in common | 13 | 6.1 |
| | NGO | 10 | 4.7 |
| | Agricultural cooperation | 8 | 3.8 |
| | Public limited company | 4 | 1.9 |
| | Limited partnership with shares | 2 | 0.9 |
| | General partnership | 1 | 0.5 |
| Activity type | Vegetable farming | 56 | 26.4 |
| | Food manufacturing | 55 | 25.9 |
| | Animal production | 45 | 21.2 |
| | Drink production and manufacturing | 31 | 14.6 |
| | Multi-industry | 13 | 6.1 |
| | Support to agriculture activity (R&D, wholesalers) | 12 | 5.6 |
| Family business | Yes | 139 | 65.6 |
| | No | 73 | 34.4 |
| Company revenue | < 101k | 34 | 16 |
| | 101k–250k | 32 | 15.1 |
| | 251k–500k | 43 | 20.3 |
| | 501k–999k | 41 | 19.3 |
| | 1M+ | 62 | 29.2 |

| | | | |
|---|---|---|---|
| Company debt | 0 | 111 | 52.4 |
| | 1–50k | 15 | 7.1 |
| | 51k–100k | 12 | 5.7 |
| | 101k–500k | 35 | 16.5 |
| | 501k–999k | 18 | 8.5 |
| | 1M+ | 21 | 9.9 |
| Company subsidy | 0 | 113 | 53.3 |
| | 1–99k | 76 | 35.8 |
| | 100k+ | 23 | 10.8 |
| Margin rate | < 11% | 15 | 7.1 |
| | 11–20% | 28 | 13.2 |
| | 21–30% | 88 | 41.5 |
| | 31–40% | 42 | 19.8 |
| | 41–50% | 13 | 6.1 |
| | 51%+ | 26 | 12.3 |
| Company mean salary *(annual gross)* | < 11k | 7 | 3.3 |
| | 11k–20k | 50 | 23.6 |
| | 21k–30k | 101 | 47.6 |
| | 31k–39k | 34 | 16.0 |
| | 40k+ | 20 | 9.4 |

N = 212

# 5. Analysis

## 5.1. Validity

We used SPSS version 27 and AMOS to conduct the statistical analysis. Multiple tests for content and construct validity were executed. First, several academic scholars were consulted regarding content validity. They agreed that the measurement scales were appropriate for measuring the constructs. Second, content validity was evaluated based on the literature (Babbie, 2001). All measurement scales were adapted from the following academic journals: Academy of Management Journal, Journal of Marketing, Journal of Management, Administrative Science Quarterly, Strategic Management Journal, and Journal of Management Studies. Third, reliability tests were used to assess content validity (Rust & Cooil, 1994; Zwick, 1988).

Construct reliability was examined using Cronbach's alpha, which exceeded 0.70 (Nunnally & Bernstein, 1994) for all factors, indicating acceptable consistency of the measurement items (Nunnally, 1978). We assessed the construct validity with convergent, discriminant, and nomological validity. Convergent validity was assessed by bivariate correlation, and it exceeded 0.3 for all constructs. We also assessed the convergence validity by considering the factor loadings. Based on our data analysis, all factors were significant with a loading greater than 0.5, which ensures a good convergence. We conducted pairwise correlations to check the discriminant validity (Anderson & Gerbing, 1988) (Table 9). We evaluated nomological validity by analyzing two-by-two correlations and making assessments within the constructs. No items were excluded to avoid reducing the theoretical construct (Hair et al., 2006).

Table 9 : Means, standard deviations, and correlation

| | | Mean | Standard deviation | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Individual knowledge inflow | 4.03 | 2.348 | | | | | | | |
| 2. | Individual exploration | 4.71 | 1.813 | .147 | | | | | | |
| 3. | Individual exploitation | 5.88 | 1.287 | -.103 | .153 | | | | | |
| 4. | Organizational empowerment climate | 5.50 | 1.546 | .245** | .253** | .024 | | | | |
| 5. | Connectedness | 4.25 | 5.033 | .107 | .24** | -.039 | .562*** | | | |
| 6. | Organizational exploration orientation | 3.83 | 0.986 | .046 | .419*** | .049 | .312*** | .225** | | |
| 7. | Organizational exploitation orientation | 4.16 | 0.711 | .049 | .398*** | .065 | .289*** | .276*** | .577*** | |
| 8. | Environmental dynamism | 4.90 | 1.408 | .014 | .154 | .01 | .231** | .008 | .346*** | .275** |

***Correlation is significant at the 0.001 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

N = 212

## 5.2. Normality and multicollinearity

We performed skewness and kurtosis tests to assess the normal distribution of our data and normality and linearity tests to avoid skewed or kurtotic data. Normally distributed data need verification that the skew index is below 3 (or above -3) and that the kurtosis index is below 10 (or above -10). The highest skew index is the Individual exploitation policy item (skew index of -2.083). The highest kurtosis index is the Individual exploitation policy item (kurtosis index of 4.953).

We relied on bivariate correlations and variance inflation factors (VIFs) to assess the level of multicollinearity in our hypothesized model. In our empirical study, none of the bivariate correlations exceeded 0.85, and all the VIFs were below 3, which complies with the cut-off point, 10 (Neter et al., 1990). Based on the bivariate correlations and VIFs, we assessed the absence of multicollinearity in our data collection.

## 5.3. Confirmatory factor analysis

The measurement model's confirmatory factor analysis (CFA) showed a good fit (CMIN /Df = 1.553; CFI = 0.904; IFI = 0.906; RMSEA = 0.051). The measurement model's results were favorable because all items significantly loaded on their corresponding factors. All standardized factor loadings were over 0.5 and remained significant even after considering the method effect,

which indicates good convergent validity among the instruments of each construct (Bagozzi & Yi, 1988).

All these results support the overall validity of the constructs measured in the study. CFA was performed to assess the measurement model's reliability, convergent validity, and discriminant validity. Cronbach's alpha and composite reliability facilitated the assessment of the construct measures' reliability. The composite reliabilities of all constructs exceeded the 0.60 threshold (Bagozzi & Yi, 1988), ensuring the reliability of our constructs. The average variance extracted (AVE) exceeded .50 of the total variance. Therefore, convergent validity is established (Fornell & Larcker, 1981). The Fornell and Larcker (1981) criterion (which compares the square root of the construct AVEs with the construct correlations) was performed to assess the discriminant validity. The measurement model showed good discriminant validity for all constructs (Table 10).

Our study limits the risk of common method variance by following Podsakoff and Organ (1986) and Podsakoff et al. (2003). Further, Harman's single-factor test was employed (Podsakoff et al., 2003). In our empirical study, the first factor explains 16% of the variance, which is below the 50% threshold, which means that it did not represent the majority of the variance. The current results indicate no effect of the common method on the analysis's findings and that the participants could distinguish the variables appropriately.

Table 10 : Construct, items, reliability, and confirmatory factor analysis

| Construct items | Factor loadings | AVE | CR | Cronbach's Alpha |
|---|---|---|---|---|
| **Individual knowledge inflow** | | .600 | .881 | .894 |
| *To what extent did you (last year) receive or gather knowledge from:* | | | | |
| - *Top-down* | | | | |
| Your direct supervisor | .633 | | | |
| One or more hierarchical level(s) higher than your direct supervisor | .751 | | | |
| - *Horizontal* | | | | |
| A counterpart in your company | .826 | | | |
| - *Bottom-up* | | | | |
| Your direct assistant | .843 | | | |
| One more hierarchical level lower than your direct assistants | .801 | | | |
| **Individual exploration** | | .502 | .874 | .881 |
| *To what extent did you (last year) engage in work-related activities that can be characterized as follows?* | | | | |
| Searching for new possibilities regarding products/services, processes, or markets | .759 | | | |
| Evaluating diverse options regarding products/services, processes, or markets | .763 | | | |
| Focusing on strong renewal of products/services or processes | .843 | | | |
| Activities of which the associated yields or costs are currently unclear | .644 | | | |
| Activities requiring significant personal adaptability | .664 | | | |
| Activities requiring you to learn new skills or knowledge | .665 | | | |
| Activities not (yet) clearly part of existing company policy | .587 | | | |
| **Individual exploitation** | | .506 | .876 | .867 |
| Activities in which you possess substantial experience | .690 | | | |
| Activities that you conduct as if they were routine | .608 | | | |
| Activities that serve existing (internal) customers with existing services/products | .712 | | | |
| Activities of which it is clear to you how to conduct them | .770 | | | |
| Activities primarily focused on achieving short-term goals | .581 | | | |
| Activities that you can properly conduct using your present knowledge | .841 | | | |
| Activities that fit into existing company policy | .741 | | | |

CMIN /Df = 1.541, CFI = 0.907, IFI = 0.909, NFI = 0.777, RMSEA = 0.051

AVE = average variance extracted; CR = composite reliability

| Construct items | Factor loadings | AVE | CR | Cronbach's Alpha |
|---|---|---|---|---|
| **Organizational empowerment climate** | | .681 | .928 | .926 |
| *To what extent do you agree with the following statements?* | | | | |
| People in our organization receive information about the organization's performance in a timely fashion. | .785 | | | |
| We provide information to frontline people so they can make responsible decisions. | .787 | | | |
| We create structures and procedures that encourage and expect people to take the initiative in improving organizational performance. | .873 | | | |
| We create new structures, policies, and practices that help people use their knowledge and motivation. | .864 | | | |
| We use teams as the focal point of responsibility and accountability in our organization. | .823 | | | |
| We work hard in our organization to develop effective, self-directed teams. | .816 | | | |
| **Connectedness** | | .638 | .898 | .903 |
| *Please indicate your degree of agreement with the following statements regarding your activity.* | | | | |
| There is ample opportunity for informal 'hall talk' among employees. | .791 | | | |
| Employees from different departments feel comfortable calling each other when the need arises. | .764 | | | |
| Managers discourage employees from discussing work-related matters with those who are not immediate superiors (reversed). | .746 | | | |
| People around here are quite accessible to each other. | .878 | | | |
| It is easy to talk with virtually anyone you need to, regardless of rank or position. | .808 | | | |
| **Exploratory orientation** | | .526 | .868 | .870 |
| *My company:* | | | | |
| Looks for novel technological ideas by thinking outside the box. | .713 | | | |
| Bases its success on its ability to explore new technologies. | .787 | | | |
| Creates products or services that are innovative to the firm. | .762 | | | |
| Looks for creative ways to satisfy its customers' needs. | .796 | | | |
| Aggressively ventures into new market segments. | .610 | | | |
| Actively targets new customer groups. | .664 | | | |
| **Exploitative orientation** | | .531 | .871 | .871 |
| *My company:* | | | | |
| Commits to improve quality and lower costs. | .758 | | | |
| Continuously improves the reliability of its products and services. | .687 | | | |
| Increases the levels of automation in its operations. | .761 | | | |
| Constantly surveys existing customers' satisfaction. | .709 | | | |
| Fine-tunes what it offers to keep its current customers satisfied. | .731 | | | |
| Penetrates more deeply into its existing customer base. | .758 | | | |
| **Environmental dynamism** | | .515 | .839 | .833 |
| Environmental changes in our local market are intense. | .627 | | | |
| Our clients regularly ask for new products and services. | .706 | | | |
| In our market, changes are taking place continuously. | .889 | | | |
| In a year, nothing has changed in our market (reversed). | .646 | | | |
| In our market, the volumes of products and services to be delivered change fast and often. | .689 | | | |

CMIN/Df = 1.541, CFI = 0.907, IFI = 0.909, NFI = 0.777, RMSEA = 0.051

AVE = average variance extracted; CR = composite reliability

## 5.4. Structural equation model

Following past ambidexterity research, we used structural equation modeling (M. J. Zhang et al., 2022). The model was over-identified, observed variables were normally distributed, latent constructs were normally distributed, and we obtained more than 90 observations (212 in our study). Thus, the maximum likelihood estimation applies to our model estimation. We assessed the measurement model validity, and the overall model fit was good. Standardized factor loadings were over 0.5 and significant at a p-value of <0.001, indicating good convergent validity among each construct's instruments (Bagozzi & Yi, 1988).

## 5.5. Key results

Table 11 shows the results of the maximum likelihood estimates to assess the relationship between individual and organizational ambidexterity and the mediating role of organizational empowerment climate.

Table 11 : Estimates

| | | | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 | Model 9 | Model 10 | Model 11 | Model 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Description of path** | | | | | | | | | | | | | | |
| Individual ambidexterity | --> | Company ambidexterity | | .310*** | | | | | | | | | | .246*** |
| Environmental dynamism | --> | Company ambidexterity | | | .311*** | | | | | | | | | .240*** |
| Individual knowledge inflows | --> | Individual ambidexterity | | | | .144* | | | .104 | | | | | .102 |
| Individual knowledge inflows | --> | Company emporwerment climate | | | | | .244** | | .244** | | | | | .195** |
| Company emporwerment climate | --> | Individual ambidexterity | | | | | | .236*** | .216** | | | | | .221** |
| Company connectedness | --> | Company ambidexterity | | | | | | | | .178** | | | .295 | .053 |
| Company connectedness | --> | Company empowerment climate | | | | | | | | | .561*** | | .561*** | .549*** |
| Company emporwerment climate | --> | Company ambidexterity | | | | | | | | | | .304*** | .295*** | .171* |
| **Control variables** | | | | | | | | | | | | | | |
| Company revenue | --> | Company ambidexterity | .075 | .096 | .104 | | | | | .092 | | .106 | .108 | .139* |
| Company debt | --> | Company ambidexterity | .247*** | .219*** | .246*** | | | | | .253*** | | .300 | .298*** | .260 |
| Company mean salary | --> | Company ambidexterity | -.146* | -.136* | -.119* | | | | | -.125* | | -.140* | -.136* | -.109* |
| Company margin rate | --> | Company ambidexterity | -.058 | -.079 | -.026 | | | | | -.063 | | -.031 | -.033 | -.037 |
| Company subvention | --> | Company ambidexterity | -.160** | -.172** | -.187** | | | | | -.164** | | -.170** | -.170** | -.200 |
| Employee log number | --> | Company ambidexterity | .121* | .105 | .135** | | | | | .085 | | .021 | .018 | .052 |
| Years since creation | --> | Company ambidexterity | -.242*** | -.219*** | -.222*** | | | | | -.209*** | | -.206 | -.201 | -.182*** |
| Activity type | --> | Company ambidexterity | -.104 | -.093 | -.069 | | | | | -.103 | | -.097 | -.097 | -.064 |
| Country | --> | Company ambidexterity | .058 | .013 | .044 | | | | | .055 | | .054 | .054 | .008 |
| Family business | --> | Company ambidexterity | -.055 | -.072 | -.032 | | | | | -.038 | | -.061 | -.058 | -.049 |
| Company status | --> | Company ambidexterity | -.034 | -.036 | -.029 | | | | | -.053 | | -.093 | -.094 | -.071 |
| Gender | --> | Individual ambidexterity | -.023 | | | -.027 | | -.010 | -.014 | | | | | -.014 |
| Age | --> | Individual ambidexterity | -.060 | | | -.064 | | -.035 | -.040 | | | | | -.040 |
| Position | --> | Individual ambidexterity | .096 | | | .148* | | .140* | .175** | | | | | .176** |
| Education level | --> | Individual ambidexterity | -.002 | | | -.001 | | -.044 | -.041 | | | | | -.042 |
| Tenure in the company | --> | Individual ambidexterity | -.138* | | | -.124 | | -.123 | -.114 | | | | | -.111 |
| Tenure in the industry | --> | Individual ambidexterity | .078 | | | .070 | | .053 | .049 | | | | | .047 |
| Individual salary | --> | Individual ambidexterity | .068 | | | .059 | | .054 | .049 | | | | | .049 |
| **Model fit statistics** | | | | | | | | | | | | | | |
| $X^2$ | | | 1057,011 | 351,077 | 462,343 | 638,659 | 60,166 | 623,205 | 757,905 | 529,030 | 93,531 | 493,297 | 745,074 | 2061,71 |
| d.f. | | | 172 | 66 | 119 | 61 | 39 | 77 | 146 | 118 | 42 | 135 | 227 | 768 |
| CMIN /Df | | | 6.145 | 5.319 | 3.885 | 10.470 | 1.543 | 8.094 | 5.191 | 4.483 | 2.227 | 3.654 | 3.282 | 2.684 |
| GFI | | | .687 | .811 | .806 | .701 | .954 | .726 | .743 | .781 | .926 | .812 | .777 | .689 |
| CFI | | | .020 | .135 | .555 | .555 | .987 | .624 | .728 | .626 | .969 | .724 | .763 | .686 |
| IFI | | | .039 | .165 | .564 | .561 | .987 | .628 | .731 | .632 | .969 | .728 | .765 | .689 |
| NFI | | | .033 | .138 | .490 | .536 | .965 | .596 | .687 | .572 | .946 | .660 | .694 | .582 |
| RMSEA | | | .156 | .143 | .117 | .212 | .051 | .183 | .141 | .128 | .076 | .112 | .104 | .089 |

***Correlation is significant at the 0.001 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)
N=212

Model 1 represents our baseline model, which depicts eleven control variables related to organizational ambidexterity and seven control variables related to individual ambidexterity. Of the eighteen control variables, only two related significantly with organizational ambidexterity: company debt ($\beta$ =.247, $p < .001$) and years since creation ($\beta$ =-.242, $p < .001$). First, companies with substantial debt are associated with higher levels of organizational ambidexterity. Second, older established companies are less likely to develop ambidextrous firm behavior. And this shows that recent start-ups who have borrowed a substantial amount probably need to behave ambidextrously.

In Model 2, we tested Hypothesis 1, which proposed that individual ambidexterity relates positively and significantly with organizational ambidexterity ($\beta = .310$, $p < .001$). Complementing this result, we note that, in Model 3, environmental dynamism relates positively with organizational ambidexterity ($\beta = .311$, $p < .001$). Therefore, $H_1$ and $H_2$ were supported.

Models 4, 5, 6, and 7 examined an organizational empowerment climate's potential mediating role on individual knowledge inflows and individual ambidexterity following Baron & Kenny's (1986) procedure. First, our data support that individual knowledge inflows relate positively with individual ambidexterity ($\beta = .144$, $p < .05$). Second, individual knowledge inflows and an organizational empowerment climate are positively associated ($\beta = .244$, $p < .01$). Third, organizational empowerment climate and individual ambidexterity are positively and significantly related ($\beta = .236$, $p < .001$). Finally, in Model 7, we introduced the three constructs simultaneously. Our results show that individual knowledge inflows no longer relate with individual ambidexterity ($\beta = .104$, n.s.). However, individual knowledge inflows relate positively with an organizational empowerment climate ($\beta = .244$, $p < .01$), which, in turn, relates positively with individual ambidexterity ($\beta = .216$, $p < .01$). Therefore, our results indicate that an organizational empowerment climate fully mediates the relationship between individual knowledge inflows and individual ambidexterity. Based on those results, $H_3$, $H_4$, and $H_5$ are supported.

Models 8, 9, 10, and 11 are used to investigate the potential mediation of an organizational empowerment climate on connectedness and organizational ambidexterity. We observed that the relationship between connectedness and organizational ambidexterity is positive and

significant (β = .178, p < .01). The results also show that connectedness relates significantly and positively with an organizational empowerment climate in a positive way (β = .561, p < .001). Moreover, an organizational empowerment climate relates with organizational ambidexterity (β = .304, p < .001). We considered connectedness, an empowerment climate, and organizational ambidexterity together to test for the mediation. In Model 11, the results show that the relationship between connectedness and organizational ambidexterity loses its significance (β = .295, n.s.), while the link between connectedness and organizational empowerment climate is maintained, as it was in the previous model (β = .561, p < .001). Similarly, organizational empowerment climate and organizational ambidexterity still significantly and positively relate (β = .295, p < .001). Our results, therefore, suggest that an organizational empowerment climate fully mediates the relationship between connectedness and organizational ambidexterity. We therefore support $H_6$, $H_7$, and $H_8$.

In Model 12, we included all the variables to ensure our results hold when considering our theoretical model as a whole.

In sum, our findings indicate through the organizational and individual-level mediations that empowerment climate fully mediates the relationship between connectedness and organizational ambidexterity and knowledge inflows and individual ambidexterity. An empowerment climate's influence is stronger than the direct influence of connectedness and knowledge inflows on ambidexterity.

# 6. Discussion and conclusion

Although past studies have investigated ambidexterity's contextual antecedents, such as different tactics (Andriopoulos & Lewis, 2009) or motivation enhanced by human resource practices (Mom et al., 2019), limited attention has been given to the factors that can facilitate individual and organizational ambidexterity. This article contributes to a deeper understanding of this dual challenge in several ways. It enriches the ambidexterity literature at the individual and organizational levels through multilevel analysis, expanding the ambidexterity literature by emphasizing the central role of empowerment climate as a full mediator and offering valuable practical insights.

First, our paper contributes to March (1991) by investigating the balance of nested systems at the individual and organizational levels. Responding to the call for further research from Raisch and Birkinshaw (2008a) and Simsek (2009), we conducted an empirical study capturing multilevel ambidexterity. Further investigating ambidexterity's micro foundation (Balarezo & Nielsen, 2022), our results complement the studies of García-Granero, Fernández-Mesa, Jansen, and Vega-Jurado (2018) and Pertusa-Ortega, Molina-Azorín, Tarí, Pereira-Moliner, and López-Gamero (2020) by investigating both micro and macro variables and studying the antecedents of individual and organizational ambidexterity from different levels of a company impacting different levels. Unlike past studies, which did not use valid scales at two levels of analysis — except Mom et al.'s (2019) work — we used valid scales for measuring individual and organizational ambidexterity, therefore contributing to calls from Turner et al. (2013) and Junni et al. (2013). Hence, we could support the relationship between individual and organizational ambidexterity.

By investigating individual ambidexterity's antecedents, our study complements past research from Mom, Van Den Bosch, & Volberda (2007), De Visser & Faems (2015), Kao & Chen (2016), and Gabler et al. (2017) that initiated the investigation of the importance of tenure, knowledge inflows, formal and informal coordination mechanisms, motivation, cognitive and social abilities, creativity, and cognitive style. This research endeavor is driven by the microfoundation perspective, which recognizes that lower-level cognitive constructions can enable higher-level phenomena. While previous studies have focused primarily on the significance of top management teams, other scholars have recently acknowledged the active

involvement of operational managers in fostering organizational ambidexterity (Zimmermann et al., 2018). Our results reveal that the ambidextrous behavior of all employees relates positively with organizational ambidextrous ability, thus providing a nuanced perspective to Lubatkin et al.'s (2006) conclusion. Contrary to the statement that the influential power to shape an organization's structure and destiny lies with the top executives at the highest level of the organizational hierarchy, our results suggest that senior executives are not the only influential group. This study also contradicts Gupta et al. (2006), who argued that not all individuals can manage exploration and exploitation effectively. We have been investigating ordinary workers — unlike past studies, which studied mainly managerial employees (Mom, Van Den Bosch, and Volberda, 2009; Rogan & Mors, 2014). Our results suggest that ordinary workers' ambidexterity influences organizational ambidexterity. Therefore, we contribute to Birkinshaw and Gupta (2013) by asking for further studies on ordinary workers and how they can dedicate their time to exploration and exploitation.

Second, we uncovered the role of organizational empowerment climate as a potential lever for addressing the challenges of exploration and exploitation at individual and organizational levels. Furthermore, we conceptualized and examined four aspects concerning ambidexterity: connectedness, environment dynamism, an empowerment climate, and individual knowledge inflows. Among them, an empowerment climate was revealed to be a significant catalyst through which organizations and individuals can better balance exploration and exploitation. Responding to Mom et al.'s (2019) call, our findings indicate that an empowerment climate is a common point of interaction between individual and organizational ambidexterity.

This full mediating relationship advances the multilevel studies of ambidexterity by demonstrating that outcomes at different levels of analysis can share a common antecedent. In extending past research, such as Alexiev et al. (2020) and Caniëls et al. (2017), we have demonstrated that an empowerment climate plays a central role in fostering individual and organizational ambidexterity. Specifically, an empowerment climate fully mediates the relationship between individual knowledge inflows and individual ambidexterity and the relationship between connectedness and organizational ambidexterity. Both individual knowledge inflows and connectedness are positively associated with an empowerment climate, indicating that an empowerment climate mitigates the challenges of knowledge sharing and fosters connection between employees, irrespective of their hierarchical positions.

Our study's empirical findings contradict Maruping & Magni (2012), who found that an empowerment climate reduces an individual's intention to explore new technologies. Conversely, we argue that when individuals have autonomy in their work, they are more likely to develop new projects and generate innovative ideas, which may enhance task enjoyment. Moreover, an empowerment climate is strongly linked to ambidexterity, as it can foster collective motivation, engagement, and creativity, which are necessary for organizational activities related to exploration and exploitation. Individuals who feel empowered at work are more comfortable with organizational risks because shared bonds create a sense of safety. An empowerment climate also influences individual ambidexterity because empowered individuals are more inclined to make autonomous decisions and embrace changes. Therefore, this study contributes to the ambidexterity literature by identifying the role of empowerment climate as a critical driver for individual and organizational ambidexterity. By investigating an empowerment climate as a mediator, our research further explores the role of strategic human resource (HR) management in the field of ambidexterity, as initiated by Mom et al. (2019).

Third, the presented results offer practical implications. Organizations must create an environment that supports innovation and experimentation while ensuring that processes are efficient and effective to achieve ambidexterity. Our findings inform managers that (for the benefit of the company) cultivating an empowerment climate as part of their organizational culture is crucial to encourage employees and the organization to engage in activities that may conflict with each other. Our findings can be helpful to SMEs in agribusiness. Investigating SMEs provides a different outlook to multinational companies (Christofi et al., 2021). Therefore, our study continued the efforts of Ajayi, Odusanya, and Morton (2017), Kiss et al. (2020), and Venugopal et al. (2020), who initiated the study of SMEs. Our paper studied agribusiness, which was considered an empirical gap according to Pertusa-Ortega et al. (2020).

# 7. Limitations & future research paths

This article is not free from limitations, suggesting several paths for further research. First, our research has been conducted in SMEs representative of the French agricultural industry. Therefore, our results cannot be generalized to larger firms or other industries. Further studies may consider other insufficiently studied industries, such as real estate, logistics, and transportation.

Second, our study adopts a cross-sectional research design, which prevents establishing causal relationships among the studied variables included in the research model. Unfortunately, due to the ephemeral venues of farmers at the international agricultural show selected by organizers annually, it was impossible to collect data longitudinally. Future research could employ a longitudinal design to examine whether ambidextrous ability at individual and organizational levels can be sustained over time to address this limitation. Such a design would provide insights into the direction (and hence, the impact) of the different factors' relationships. More interestingly, this would reveal the top-down or bottom-up interactions across levels of analysis. Therefore, we encourage future studies to analyze the relationships between an empowerment climate and multilevel ambidexterity using longitudinal research design. We can explore whether individual ambidexterity contributes to organizational ambidexterity or vice-versa. For instance, Jansen et al. (2016) argued that the leadership of senior executives impacts the lower levels of companies, which suggested a potential top-down approach from organizational to individual ambidexterity that may coexist with a bottom-up approach that emerges from people skills and capabilities of a higher level of ambidexterity.

Third, our empirical study did not measure the negative outcomes of multilevel ambidexterity. Further research should also consider the outcomes of individual ambidexterity not considered in the scope of our study. On that point, we argue that the debate about whether individual ambidexterity has positive or negative impacts on performance has created a need for further studies. Most previous studies (Jasmand, Blazevic, and De Ruyter, 2012; Van Der Borgh & Schepers, 2014; Kao & Chen, 2016; Yu, Gudergan & Chen, 2018; Caniëls & Veld, 2019) analyzed the effect of individual ambidexterity on individual performance using different measurements of variables. Similar studies have examined the consequences of individual ambidexterity on individual performance. Sok et al. (2016) found that individual ambidexterity

may benefit individual performance but can also lead to role stress or similar unfavorable job outcomes. However, we also acknowledge two studies that report negative effects of individual ambidexterity: Pertusa-Ortega et al. (2019) found that the more ambidextrous a manager's behavior, the more they may suffer from cognitive strain. And Gabler et al. (2017) discovered that ambidextrous employees experience role conflict. Therefore, studying individual and organizational ambidexterity's outcomes (for instance, in terms of economic, environmental, and social performance) would be a meaningful further research path.

# CHAPTER 3

## The triple bottom line of multilevel ambidexterity in the algae industry: Individuals, companies, and interorganizational ties matter

## Abstract

This study focuses on multilevel — individual, organizational, and interorganizational — ambidexterity and its economic, environmental, and social performance outcomes. Multilevel data were collected through two surveys distributed to CEOs and their respective employees. We focused on companies collaborating in an agribusiness ecosystem that managed the value chain of algae-based activities. Based on 32 companies' and 304 individual employees' responses, our findings indicate that individual ambidexterity — at the individual level — partially mediates the relationship between employee knowledge sharing and individual environmental consciousness. Unlike past research, our data does not reinforce the relationship between organizational ambidexterity and company economic performance but supports the relationship between organizational ambidexterity and environmental performance. We obtained comparable results at the interorganizational level — under industry-specific tensions — as interorganizational ambidexterity relates positively with interorganizational environmental performance but not interorganizational economic performance. Our microfoundational approach's results suggest a strong relationship between the organizational and interorganizational levels but no relationship between the individual and organizational levels where ambidexterity and economic, environmental, and social performance is concerned. Our study offers three main contributions. First, it enriches the existing knowledge on individual ambidexterity (which significantly impacts the relationship between knowledge sharing and environmental consciousness). Second, by filling the research gaps between ambidexterity and its economic, environmental, and social outcomes, we reveal that ambidexterity is beneficial solely to environmental performance at the individual, organizational, and interorganizational levels. Third, we enrich existing literature on multilevel ambidexterity. We investigated the links between individual, organizational, and interorganizational levels using a double-bathtub framework, in which the higher one is supported — and the lower one is not. Finally, we offer managerial recommendations to help virtuous multi-stakeholder networks transition toward increased sustainability and environmental performance.

**Key words:** multilevel; ambidexterity; microfoundation; the triple bottom line; agribusiness

# 1. Introduction

“Finding an appropriate balance is made particularly difficult by the fact that the same issues occur at levels of nested systems—at the individual, organizational, and social system levels” (March, 1991, p. 72).

Therefore, organizations need individuals capable of balancing their workplace’s exploration and exploitation activities to contribute to a specific form of organizational ambidexterity (Mom et al., 2019). At this statement’s origin lies ambidexterity, defined as the ability to manage contradictory activities (Duncan, 1976), such as exploration (for seeking new alternatives and solutions that may be uncertain) and exploitation (for improving and extending existing processes or technologies) (March, 1991).

Ambidexterity studies have primarily been conducted at the firm level. Simultaneously pursuing exploitative and explorative endeavors is essential for achieving organizational ambidexterity. The former helps to refine and optimize existing processes, leveraging the organization's current expertise. The latter focuses on innovation and venturing into new areas to adapt to changing environments and capitalize on potential opportunities (Junni, Sarala, Taras, & Tarba, 2013; Tushman & O’Reilly, 1996). However, Raisch and Birkinshaw (2008a), Simsek (2009), and Tarba, Jansen, Mom, Raisch, & Lawton (2020) called for further research to unpack organizational ambidexterity as a complex phenomenon built and nurtured at different hierarchical levels — a challenge because reaching an ambidextrous equilibrium depends upon nested systems in organizations.

Scholars have explored various levels of analysis to foster ambidexterity across multiple organizational layers. And this includes investigating lower levels of organizational ambidexterity, often called microfoundations (Balarezo & Nielsen, 2022). These microfoundations encompass different dimensions, such as the business unit level (Birkinshaw & Gibson, 2004), the group and team level (Jansen, Kostopoulos, Mihalache, & Papalexandris, 2016), and the individual level (Keller & Weibler, 2015).

The prevailing focus on organizational ambidexterity has neglected to examine how individual employees navigate conflicting demands and integrate exploration and exploitation activities. As a result, recent studies have highlighted the significance of comprehending collective issues,

such as organizational ambidexterity, by explicitly considering the individual level. According to Gibson and Birkinshaw (2004), ambidexterity necessitates ambidextrous employees' motivation and active involvement. Felin and Foss (2005) further argued that organizations are fundamentally composed of individuals — and without individuals, there is no organization. However, this argument has been overshadowed by the increasing emphasis on collective conceptualizations (such as structure, routines, capabilities, culture, and institutions) in much of the recent strategic organization research. Furthermore, the literature has largely overlooked how individual and organizational ambidexterity relate (Tempelaar & Rosenkranz, 2019). Consequently, ambidexterity should be observed at the organizational macro-level and the individual level (Raisch et al., 2009; Turner et al., 2013).

The interlevel connections between individual and organizational ambidexterity and links between organizational and interorganizational ambidexterity remain largely unexplored. The interorganizational level, in particular, remains the least explored in multilevel ambidexterity research. Only five instances have investigated ambidexterity at this level, including U.S. biotechnology alliances (Karamanos, 2012; W. Li & Wang, 2019), Indian biotechnology alliances (Pereira et al., 2021), partnerships within the fuel cell industry (Russo & Vurro, 2010), and networks of Spanish municipalities (Barrutia & Echebarria, 2019).

Further research should therefore consider interorganizational, organizational, and individual ambidexterity to understand the interlevel interactions and the outcomes obtained within and across levels more thoroughly. However, no ambidexterity studies considering individual-level, organizational-level, and interorganizational-level factors exist. The analysis level matters, as Junni et al.'s (2013) meta-analysis showed that the impact on performance decreases but remains positive when decreasing the levels of observation.

Performance, in particular, is at stake because ambidextrous organizations survive and succeed better than others (Andriopoulos & Lewis, 2009). Lubatkin et al. (2006), Vrontis et al. (2017), and Yu et al. (2020) argued that ambidexterity offers companies a higher overall performance. However, organizational ambidexterity’s outcomes have been restricted to financial gains, not considering other performance types, such as environmental and social performance. Therefore, we argue that there is a need more thoroughly investigate multilevel ambidexterity’s outcomes in terms of the triple bottom line (TBL). The current body of knowledge lacks empirical studies

examining how ambidexterity can be investigated more thoroughly to achieve more Corporate Social Responsibility (CSR) goals. We argue that the link between innovation and triple-bottom-line performance remains scarce. Thus far, limited effort has been made to address the inquiry posed by George et al. (2016) regarding the organizational practices and strategies that foster innovation for socially inclusive growth.

In addition to the missing evidence regarding the relationship between ambidexterity and the TBL, an understanding from a multilevel perspective is needed. Organizations can achieve their economic, environmental, and social objectives using top-down or bottom-up approaches (Henriques & Richardson, 2004). In a top-down approach, executives use a form of control and assessment thanks to adapted systems and structures. The bottom-up approach relies on innovation and individual change management to fulfill the TBL objectives. While mainly the top-down approach has been studied in the past, further research would uncover the role played by employees as individual stakeholders influencing the organizational direction and contributing to the partnerships developing at the inter-organizational level and strengthening the TBL performance. And this valuable insight would enable us to assess whether firms perform equally well economically, environmentally, and socially — thanks to ambidexterity across multiple levels — individual, organizational, and interorganizational. Therefore, we investigate the following research question: "*How do multilevel — employee, company, and interorganizational — ambidexterity intertwined contribute to economic, environmental, and social performance?"*

Our intended contributions further characterize the role played by individual ambidexterity at the intersection of predictors and outcomes (Mom, van Den Bosch, & Volberda, 2009; Rogan & Mors, 2014; and Tempelaar and Rosenkranz, 2019). First, we contribute to the ambidexterity literature by considering the TBL lens (George et al., 2016) at the organizational level and partially at the individual and interorganizational levels (Zimmermann et al., 2015). Second, we further specify the microfoundations of ambidexterity and performance by revealing the interactions between individual and organizational levels and between organizational and interorganizational levels using a double-bathtub framework (Raisch and Birkinshaw's, 2008a; Simsek's, 2009; and Tarba, Jansen, Mom, Raisch, & Lawton, 2020).

# 2. Theoretical Background

## 2.1. Multilevel ambidexterity

Understanding multilevel ambidexterity connects with the notion of microfoundation, which recognizes the value of employees in generating new information and exchanging it to increase the firm's innovation output (Distel, 2019; Rothaermel & Hess, 2007). However, we note substantial differences between the multilevel theory (Kozlowski et al., 2013) and microfoundation (Felin et al., 2015). In particular, microfoundation suggests investigating lower levels of analysis and bringing individuals into the scope of empirical studies. Foss & Pedersen (2016) also encouraged identifying a phenomenon's immediate origins at analysis levels lower than the phenomenon itself (for example, at the team level). As Felin et al. (2015) suggested, each level accounts for at least some of the explicative variance in a nested system. Based on this reasoning applied to organizations, investigating which level (individual, organizational, or interorganizational) primarily explains performance variance requires further studies.

Unlike multilevel studies, single-level ambidexterity studies, as highlighted by Hitt et al. (2007), limit our complete grasp of the subject by neglecting cross-level interactions and overgeneralizing the effects of antecedents confined to one level. Therefore, an increased understanding of ambidexterity should be developed from a multilevel perspective to capture the nested arrangements within organizations. Raisch and Birkinshaw (2008a) argued, "We would like to accentuate the need for studies spanning multiple levels of analysis…. Multilevel concepts and measures may be required to fully capture a firm's exploitation and exploration activities" (p. 397). Raisch and Birkinshaw (2008a) further emphasized the importance of executing multilevel research to understand the organizational paradigm within different management systems. Multilevel thinking revolves around how corporate entities are structured in nested arrangements (Hitt, Beamish, Jackson, & Mathieu, 2007).

In an early attempt, Simsek (2009) initiated a multilevel study to comprehend ambidexterity, employing individual and organizational units of analysis. Later, Zimmermann et al. (2015) explored the role of individuals in ambidextrous strategic alliances. More recently, scholars like Harris and Wood (2020) and Mom, Chang, Cholakov, and Jansen (2019) conducted dual-level analyses considering the organizational and individual levels. And Christofi, Vrontis, and

Cadogan (2021) investigated ambidexterity from the perspectives of teams and individuals. Finally, García-Granero, Fernández-Mesa, Jansen, and Vega-Jurado (2018) and Pertusa-Ortega, Molina-Azorín, Tarí, Pereira-Moliner, and López-Gamero (2020) emphasized the need for further research on the intricate multilevel interdependencies at the individual, organizational, and interorganizational level concerning acquiring and maintaining ambidexterity. To date, we do not acknowledge any studies studying those three levels of analysis in one empirical study.

## 2.2. Individual-level ambidexterity

Bledow, Frese, Anderson, Erez, and Farr (2009) defined individual ambidexterity as "a person's ability to execute conflicting activities and be able to change between different mindsets and action sets" (p. 322). Building upon this notion, Tempelaar and Rosenkranz (2019) further elaborated that individual ambidexterity represents an individual's ability to engage in exploitation and exploration activities while identifying the potential synergies between them (Mom, van Den Bosch, & Volberda, 2009; Rogan & Mors, 2014). Additionally, individual ambidexterity can also be seen as an individual's ability to be actively involved in opposing functions (Bledow et al., 2009; Miron-Spektor, Gino, & Argote, 2011; W. K. Smith & Tushman, 2005). It refers to the ability to effectively navigate and excel in situations that demand conflicting skills and perspectives.

Individual ambidexterity can be understood as a multidimensional concept referring to how much individuals engage in explorative and exploitative activities in their daily endeavors (Bledow et al., 2009; Mom et al., 2009). Exploitation involves actions aimed at extending and leveraging existing assets, skills, and knowledge, while exploration encompasses activities focused on acquiring broader knowledge and pursuing new opportunities (Benner & Tushman, 2003; Gupta, Smith, & Shalley, 2006; Jansen, George, van den Bosch, & Volberda, 2008).

Ambidextrous individuals face various obstacles to effectively combining conflicting tasks. Gupta et al. (2006) indicated that excelling simultaneously at exploration and exploitation (or even switching between routines for these activities) would prove difficult for an individual. Similarly, Taylor and Helfat (2009) emphasized that individual ambidexterity requires effectively integrating knowledge to respond to businesses' distinct exploratory and

exploitative demands. Individuals navigating these demands must possess sharply contrasting values, contextual knowledge, and behavioral expectations that align with the opposing natures of exploration and exploitation (Leavitt, Reynolds, Barnes, Schilpzand, & Hannah, 2012; Mom et al., 2009). Previous studies have examined an individual's capacity to perform contradictory tasks but have not explained why some individuals can accomplish them while others cannot (Raisch, Birkinshaw, Probst, & Tushman, 2009).

Comprehending exploration within organizations involves examining its structure and management approaches (Beugelsdijk, 2008; DeCanio et al., 2000). Mom et al. (2015) proposed that the information individuals possess (including their characteristics and antecedents) significantly influences their relationship with exploration within an organization. Individual decisions about whether they are interested in acquiring new knowledge play a crucial role in this context. In alignment with this perspective, Gibson & Birkinshaw (2004) highlighted that individuals are central to an organization's capacity to explore and exploit, as they utilize their judgment to allocate their time between alignment-oriented and adaptation-oriented activities. And this highlights the importance of individual behavior in shaping an organization's exploration efforts.

Ambidextrous behavior has been the focus of previous research (with particular emphasis on top management employees). Individuals at higher hierarchical levels may experience more pressure and possess greater autonomy to exhibit ambidextrous behaviors (Mom et al., 2009). While senior managers are assumed to play a critical role in setting directions and designing solutions, frontline managers have been found to take a more proactive role in initiating ambidextrous strategies and reconciling exploration-exploitation tensions (Zimmermann et al., 2018). In contrast, non-managerial employees face a different situation because they cannot achieve ambidexterity by assigning and managing resources among employees engaged in exploration or exploitation activities. Based on Kauppila and Tempelaar's (2016) initial attempt to examine the background of ambidexterity for non-managerial employees, we argue that there is a lack of understanding about how organizations influence how employees can execute ambidextrous activities in a multilevel approach.

## 2.3. Organizational-level ambidexterity

Organizational exploration, also called knowledge generation (Spender, 1992), involves actively pursuing new knowledge and discovering previously unknown aspects (March, 1991). Levinthal & March (1993) described it as the search for knowledge and understanding of things with the potential to be known. Although exploration can lead to long-term benefits, it inherently carries uncertainty (March, 1991). Collaborative explorative efforts are essential for establishing new organizational competencies (Faems et al., 2005). Such collaborations prioritize joint experimentation and learning (Koza & Lewin, 1998), seeking novelty and new perspectives rather than mere efficiency (Faems et al., 2005).

In contrast, organizational exploitation, also called knowledge application (Spender, 1992), involves utilizing and refining existing knowledge and resources (March, 1991). As Levinthal & March (1993) depicted, exploitation revolves around using and developing things already known. March (1991) further emphasized that exploitation's essence lies in refining and extending existing competencies, technologies, and paradigms. The main focus is leveraging the organization's existing skills (Koza & Lewin, 1998) and acquiring complementary knowledge to enhance current technologies further (Teece, 1992). Exploitative collaboration primarily aims to strengthen and optimize the organization's competencies (Faems et al., 2005). And according to Levinthal and March (1981), employing these familiar technologies during the exploitation phase can reduce errors and failure rates, increasing overall efficiency within the firm.

Most studies have primarily explored how organizations achieve short-term and long-term outcomes at the organizational level. The prevailing focus in ambidexterity research has been on a macro-level perspective, providing valuable insights into the procedures, structures, and strategies that enhance an organization's capacity to explore and exploit knowledge simultaneously. This ability to achieve organizational ambidexterity is crucial for establishing a sustained competitive advantage over time (He & Wong, 2004; O'Reilly & Tushman, 2013), which has sparked increased interest in studying and understanding it. Consequently, research has delved into the trends, determinants, and effects of ambidexterity in organizations (O'Reilly & Tushman, 2013) and explored the influence of various hierarchical firm structures on organizational ambidexterity (Beckman, 2006; Jansen, Simsek, & Cao, 2012; S. Lee & Meyer-

Doyle, 2017; Phelps, 2010; Uotila, Maula, Keil, & Zahra, 2009). Understanding the interlevel relationships between individual and organizational ambidexterity and the relationship between organizational and interorganizational ambidexterity remains unexplored.

## 2.4. Interorganizational-level ambidexterity

Interorganizational ambidexterity refers to balancing conflicting strategic goals among different organizations (Wassmer, Li, & Madhok, 2017). In interorganizational dynamics, research has mainly focused on how external stakeholders are mobilized to contribute to firms' abilities to achieve short-term and long-term objectives. Recently, Duysters, Lavie, Sabidussi, and Stettner (2019) explored ambidexterity's antecedents by examining firms' interdependence in the electronics sector. They argued that a firm's exploration level is limited when considered only an independent player, highlighting the significance of considering the broader interorganizational context to foster ambidexterity.

Interorganizational antecedents can help organizations increase their ambidexterity. One critical challenge in multilevel studies is pinpointing where the equilibrium is achieved or where the trade-off between exploration and exploitation is resolved. Future research should explore organizational factors and environmental contingencies to understand how companies achieve organizational-level ambidexterity by balancing exploration and exploitation alliances. Untangling the complex interactions between organizational conditions and industry context is also crucial (W. Li & Wang, 2019). Further studies should expand on past research by incorporating additional levels of analysis while accounting for level-specific tensions to enhance our comprehension of ambidexterity's intricate nature. This comprehensive approach will contribute to a more comprehensive understanding of interorganizational ambidexterity.

Interorganizational ambidexterity remains relatively underexplored compared to other levels. Previous studies have focused primarily on investigating ambidexterity between partner firms at various levels of analysis, such as intraorganizational ambidexterity (Gibson & Birkinshaw, 2004) and interorganizational ambidexterity (Lavie & Rosenkopf, 2006). For example, Lavie and Rosenkopf (2006) conducted a study that examined 19,928 alliances formed between 1985 and 2001. And Zimmermann et al. (2015) delved into the long-term management of ambidexterity between two partners to gain insights into how ambidexterity can emerge and

persist within alliances. Despite these contributions, the specific mechanisms for effectively managing ambidexterity in an interorganizational context require further investigation and research — particularly regarding interorganizational ambidexterity's outcomes.

## 2.5. Beyond economic performance in agribusiness and SMEs

Past research has argued that organizations with substantial ambidexterity can perform and survive better than others (Andriopoulos & Lewis, 2009). Economic performance has been considered a key outcome of organizational ambidexterity. However, given that environmental and social objectives are increasingly becoming more prominent, organizations report economic performance indicators but are also expected to positively impact larger societal goals (which can be economic, environmental, and social), also called the TBL. We still lack knowledge about economic, environmental, and social performance at the organizational, individual, and interorganizational levels. And investigating ambidexterity's antecedents is necessary to achieve economic, environmental, and social performance. While the body of knowledge on ambidexterity has been widely studied (and the relationship between company ambidexterity and firm economic performance), we argue that environmental and social performances are rarely studied as a complement to economic performance.

Yet ambidexterity and the TBL are crucial for numerous industries, particularly agriculture. The agriculture industry is essential as an economic pillar and to feed people — consistent with the United Nation's second Sustainable Development Goal: "zero hunger" (United Nations, 2015). Besides TBL, agribusiness is highly concerned with environmental impact (Notarnicola et al., 2017). Consistent with Pertusa-Ortega et al. (2020), a limited number of publications on ambidexterity in industries with low innovation intensity exist. Moreover, agriculture (like other industries, such as tourism, real estate, logistics, and transport) has not been examined regarding multilevel ambidexterity.

In agribusiness, we argue that debates should not be limited to the exploration/exploitation paradoxes but should also consider industry-specific tensions critical at the interorganizational level. Debates can be extended to industry-specific challenges (such as risk mitigation) or adapting activities to climate change. Challenges can also be made more specific, for example, by associating operating activities with higher-yielding activities and exploration with activities

that help organizations cope with environmental transitions. Consequently, and as per Hughes et al. (2020), we posit that there is a need to study somewhat less conventional industries (i.e., those less technological or involved in research and development), such as agribusiness, where ambidexterity and the TBL matter.

Most agricultural firms are small- and medium-sized enterprises (SMEs). While multinational companies frequently discuss the TBL, it is rarely the case for SMEs. Therefore, we lack studies on the TBL in agricultural SMEs. A substantial number of ambidexterity studies have focused on multinational companies. For instance, Christofi et al. (2021) reviewed 26 studies on the micro level of ambidexterity in multinational enterprises. However, there has been relatively less research on ambidexterity's microfoundation in SMEs. Only three studies have addressed this: Ajayi, Odusanya, and Morton (2017), Kiss et al. (2020), and Venugopal et al. (2020), which do not capture the TBL as an outcome of multilevel ambidexterity.

In SMEs, individuals frequently hold several functions simultaneously, meaning that individual ambidexterity matters to firm performance. And as SMEs often rely on strategic partnerships to complement their internal capabilities, interorganizational ambidexterity could become more prominent than other ambidexterity levels. More attention should be paid to studying SMEs, as ambidexterity can be a vital factor in their short-term survival and long-term success and help uncover ambidexterity’s impact on SMEs’ TBL.

# 3. Hypotheses development

## 3.1. Individual-level relationships

### 3.1.1. Employee knowledge sharing and environmental consciousness

Knowledge seekers demonstrate enthusiasm in sharing their knowledge with others. This social and pedagogical willingness demonstrates the altruism to inform others and share discoveries. Individuals may also be more affected by environmental issues concerning our societal members due to a sense of belonging. Anzola-Román et al.'s (2023) results indicated that individual knowledge correlates positively with environmental CSR orientation. More precisely, organizational practices can strategically strengthen how employees apply and share their knowledge (Gangi et al., 2019; González-Masip et al., 2019) to increase individual involvement in environmental matters.

Knowledge sharing is essential to exchange elusive knowledge or specialized skills (for example, regarding the complexity of environmental impact). Some environmental protection knowledge is scientific and not easily accessible to most employees. Consequently, sharing knowledge (such as the vulgarization of environmental studies) can increase people's environmental awareness. This environmental consciousness can induce more environmentally-conscious behavior and environmental actions and initiatives in daily business activities and involvement in projects, endeavors, or events that address environmental issues. Therefore, we propose the following hypothesis:

Hypothesis 1: Employee knowledge sharing relates positively with environmental consciousness.

### 3.1.2. Employee knowledge sharing and employee ambidexterity

Employee ambidexterity refers to the individual's ability to switch between and balance exploration and exploitative activities (Bledow et al., 2009). Tempelaar and Rosenkranz (2019) further characterized individual ambidexterity as the individual's ability to practice exploitative and explorative activities and to identify synergies between them (Mom, van Den Bosch, & Volberda, 2009; Rogan & Mors, 2014). While individuals must fulfill their responsibilities and

daily tasks, they may also recognize the significance of exploration in the search of new solutions and the development of substantial new products or processes. This ability to balance exploration and exploitation does not emerge without a period of learning as argued March (1991). Thus, knowledge sharing is also a mean of socializing, sharing ideas, and staying attuned to long-term professional needs (Park & Kim, 2022).

On one side, knowledge sharing is important for renewing the knowledge base of individuals who are trying to explore new avenues. Knowledge sharing is very important for employee exploration, as it can contribute to the seeking new possibilities regarding products/services, processes, or markets. Knowledge sharing also helps evaluate the various growth options in exploration activities. And knowledge sharing is essential when employees assess the potential yields (and costs) of a new product/service line resulting from exploration activities.

But individuals also share their knowledge about activities in which they have substantial experience, which favors exploitation activities. Sharing knowledge can enable existing activities to be seen as a helpful routine to serve existing customers and achieve short-term goals. Striking an equilibrium between exploration and exploitation requires a sense of ease in one's job position, which is necessary to develop curiosity and knowledge sharing.

Together, our arguments postulate that employees benefiting from their open mindset and time management skills can actively share knowledge with other colleagues, making them more aware and better equipped to navigate exploration and exploitation activities. Following this line of argument, we assume that:

*Hypothesis 2: Employee knowledge sharing relates positively with employee ambidexterity.*

### 3.1.3. Employee ambidexterity and environmental consciousness

Most studies focus on examining the implications and patterns related to individual ambidexterity. Specifically, researchers like Jasmand, Blazevic, and De Ruyter (2012), Van Der Borgh & Schepers (2014), Kao & Chen (2016), Yu, Gudergan & Chen (2018), Caniëls & Veld (2019) have explored the impact of individual ambidexterity on individual performance, employing various measurements and variables for their analyses.

Employee exploration involves widening the range of possibilities and envisioning a new future for products, services, processes, and markets. New horizons can integrate additional needs (such as environmental protection) into the decision-making process, thus encouraging colleagues to express their ideas and opinions regarding environmental issues. While individuals may seek to renew existing activities, they may also judge that the consequences of their actions could impact the environment.

Furthermore, experienced employees that manage their tasks effortlessly may be more inclined to devote time to other environmental matters. In this sense, a person may voluntarily carry out environmental actions and initiatives in their daily work activities alongside routine activities. As a result, an efficient individual can also advise colleagues regarding how to protect the environment more effectively. Serving existing customers can encourage individuals to evolve the offering toward more sustainable products and services. Such an evolution can be seen as positive for the organization's image.

Employees who dedicate sufficient time to exploring new actions within or beyond the scope of their professional responsibilities while effectively carrying out their daily tasks contribute to short-term economic performance and longer-term environmental performance. Striking a balance between exploitation and exploration can enhance awareness of the company's and society's needs, fostering environmental consciousness and a strong commitment to reducing the organization's impact on the planet. Moreover, highly committed employees are motivated to act in their company's and the environment's best interests. Building on this argument, we postulate that:

*Hypothesis 3: Employee ambidexterity relates positively with environmental consciousness.*

### 3.1.4. Mediation of employee ambidexterity

As encouraged by Aguilera et al. (2021), employees should be considered governance actors able to make significant environmental progress. Enhancing employee communication can address environmental issues (for example, by supplying the Environmental Management System with key pollution sources and generating new ideas to initiate actions in this direction) (Aragón-Correa et al., 2013). The relationship between employee knowledge sharing and environmental consciousness can be explained by employee ambidexterity.

Employee knowledge sharing allows individuals to share specialized knowledge regarding ecology and environmental matters, influencing future actions. It helps evaluate the environmental impact and associated costs of exploration activities. We argue that knowledge sharing may be amplified when individuals have an exploratory mindset, searching for new possibilities. Environmental awareness can involve accessing specific knowledge, making it accessible to others, and enhancing overall exploration capability.

Sharing existing knowledge and being environmentally conscious can be considered philanthropic behaviors because helping others in their job through knowledge sharing (much like caring for the planet) comes with a level of caring for others. Knowledge sharing can therefore impact the degree to which individuals volunteer to address environmental issues. We can assume a person with strong exploitation may be more prone to sharing such knowledge for the good of the company and the planet. Individuals sharing knowledge can (to some extent) encourage other colleagues to express their ideas and opinions on environmental issues in a constructive dialogue. Therefore, past knowledge developed in exploitation activities can promote better environmental consciousness. We can assume that repetitive attempts and actions that require time and well-developed processes established through exploitation are needed to change individual behavior regarding environmental consciousness.

Bringing together the two previous lines of argument, we argue that knowledge sharing relates with environmental consciousness, depending on the degree of individual exploration and exploitation — individual ambidexterity. The inclination toward knowledge sharing and environmental consciousness (philanthropic behaviors) likely stems from their constant endeavor to balance short-term and long-term activities that significantly impact the environment. Based on this reasoning, we suggest the following hypothesis:

*Hypothesis 4: Employee ambidexterity positively mediates the relationship between employee knowledge sharing and environmental consciousness.*

## 3.2. Organizational-level relationships

### 3.2.1. Company ambidexterity and company economic performance

It has been contended that simultaneous exploitation and exploration activities are critical for a firm's long-term survival and success (March, 1991). Previous research has also shown that ambidexterity positively affects performance growth (Geerts et al., 2010) because firms capable of simultaneously pursuing exploration and exploitation activities overcome the tradeoff between pursuing only one of those activities. Organizational ambidexterity is particularly relevant in fast-paced environments with high competition and frequent technological changes (Benner & Tushman, 2003; W. Zhang et al., 2019). In such competitive settings, previous studies have shown the positive impact of organizational ambidexterity on innovation, survival rates, and economic performance (O'Reilly & Tushman, 2013; W. Zhang et al., 2019). And this is explained by the crucial role of ambidextrous orientation, which offers potential superior financial outcomes (He & Wong, 2004; Junni et al., 2013). In less competitive settings (where incremental change is favored), higher firm performance can also be attributed to the learning effects derived from ambidexterity (Luger et al., 2018).

In contrast, neglecting to develop organizational ambidexterity can negatively impact a company's economic performance. Insufficient investment in exploitation operations can result in inadequate quality or efficiency, exposing the company to competitive disadvantages. Conversely, insufficient investment in exploration increases a company's likelihood of being affected by unanticipated changes. Ambidexterity positively impacts organizational performance and success (Ambilichu & Yekini, 2022; Birkinshaw & Gibson, 2004). Therefore, we argue that:

*Hypothesis 5a: Company ambidexterity relates positively with company economic performance.*

### 3.2.2. Company ambidexterity and company environmental performance

Organizational success is no longer limited to financial returns, as environmental performance is increasingly considered in evaluating companies' performance using a triple-bottom-line perspective.

First, company exploration is about looking for novel technological ideas by thinking outside the box, which can enable firms to find solutions for reducing carbon emissions. Similarly, the exploration of new technologies may limit maximum water consumption. We also observe critical changes in the market. For example, a firm can target new customer groups by launching secondhand product sales and recycling. And to venture into new market segments, customers might be more environmentally concerned, therefore requesting the firm demonstrate significant actions to preserve the environment.

Second, company exploitation entails the need to improve quality and lower costs. We see that lowering costs is not necessarily detrimental to environmental performance. By improving the reliability of its products and services, the firm faces fewer quality issues and limits waste, contributing to better environmental performance. Automation in operations can also reduce electricity consumption and transportation, improving companies' environmental performance. Firms engaging in exploitation activities are sensitive to existing customer satisfaction surveys indicating customers are increasingly careful when purchasing products and services in which green factors come into play. Therefore, to retain their customers in current lines of business, firms must demonstrate tangible results from investing significantly in sustainable development.

Third, relying solely on exploitation may prove unsustainable in the long run due to resource depletion, vulnerability to governmental regulations, and the potential risk of scandals involving unions or Non-Governmental Organizations. Meanwhile, relying solely on exploring new paths can prevent the company from having any real impact on the environment, as changes take time. However, integrating exploration activities alongside exploitation can foster a proactive approach to mitigating a company's future environmental impact as the business expands. Thus, ambidexterity allows the company to develop new, more environmentally-friendly activities while measuring their positive long-term environmental impact. Building on these arguments, we hypothesize that:

*Hypothesis 5b: Company ambidexterity relates positively with company environmental performance*.

### 3.2.3. Company ambidexterity and company social performance

First, being inclined to favor innovation, employees can be more engaged and creative and, therefore, more satisfied performing their jobs. Actively targeting new customer groups is challenging for firms that must protect employees and create a supportive working environment. Companies engaging in exploration are more open to new ideas generated from a bottom-up approach from the employees to the management. And this enables employees to be supported in their jobs, which impacts their firms' social performance. Companies' exploration requires exploring new technologies (which requires employee training). And employees may feel more valued because the company is investing in them, which is a form of social reward. Such social outcomes of company exploration can also be measured in terms of employee satisfaction and turnover.

Second, companies engaging in exploitation need to improve the quality and reliability of their products, therefore requiring the full engagement of people at work. There is, therefore, a need to develop a suitable human resources policy to support employees in this quest for excellence. Exploitation also necessitates that companies increase the levels of automation in their operations, which can require employees to hold more complex jobs to master new technology that requires training. And this can be considered a positive driver of job satisfaction and a critical indicator of company social performance.

Finally, companies supporting exploration and exploitation activities matter to employees at work and social performance in general. When firms encourage exploration activities, it demonstrates that employees can explore new avenues by offering protection and support that catalyzes social performance at work. Organizational ambidexterity requires that firms offer employees appropriate training for performing exploration and exploitation activities. Such training courses are critical to motivate employees at work, value their efforts, increase job satisfaction, and reduce turnover, all of which contribute to organizational social performance. Thus, we posit:

*Hypothesis 5c: Company ambidexterity relates positively with company social performance.*

## 3.3. Interorganizational relationships

### 3.3.1. Industry-specific tensions and interorganizational ambidexterity

The agricultural industry (like other industries) is strongly affected by economic problems. But as Pedersen & Andersen (2015) suggested, tensions depend substantially on the sector's attributes. Current industry tensions may affect a company's activity. For instance, the stress of maintaining affordable prices and good productivity while reducing phytosanitary products can lead businesses to review their usage and processes. In this way, sectoral tensions may motivate business players to look together for new solutions while ensuring they remain profitable with efficient processes. We argue that the stronger the tensions perceived by the agribusiness player, the more likely they are to react by developing a form of interorganizational ambidexterity. In other words, we argue that:

*Hypothesis 6: Industry-specific tensions relate positively with interorganizational ambidexterity.*

### 3.3.2. Interorganizational ambidexterity and interorganizational economic performance

Interorganizational connections promote knowledge sharing. And a deeper integration of knowledge is expected to facilitate the recognition and incorporation of emerging information regarding new requirements and constraints during development work (Tiwana, 2008). Developing interorganizational exploration is critical, as it challenges current well-established models and practices. Such interorganizational exploration can be executed by interacting with external stakeholders in the same cluster. Exploration with external stakeholders is crucial to respond to industrial changes and adapt quickly. Exploring with external stakeholders enables partners to challenge their existing models and develop new avenues that offer higher margins. And interorganizational exploitation is critical because it helps partners compete more effectively in the marketplace as a cluster rather than as individual companies. By developing interorganizational ties, firms can avoid wasting resources on unproductive activities by letting other partners use them, resulting in positive economic performance for both stakeholders (the one selling a resource they do not need and the one able to access resources at affordable and competitive prices). Therefore, interorganizational ambidexterity is assumed to offer strategic advantages to the stakeholders from a given cluster, who can compete more effectively (which

will generate higher profits and greater value-sharing among stakeholders). Hence, we posit that:

*Hypothesis 7a: Interorganizational ambidexterity relates positively with interorganizational economic performance.*

### 3.3.3. Interorganizational ambidexterity and interorganizational environmental performance

Interorganizational relations imply obtaining agreement with partners to become mutually involved in activities contributing to preserving the environment (Hollen et al., 2013). Interorganizational exploration is a way to rethink how these activities can better meet new environmental requirements and tackle substantial environmental challenges with external partners in the same cluster. Existing models can be questioned regarding their environmental impact and further improved by developing interorganizational exploration offering new ideas, accessing new knowledge, and exploring new technologies (Z. Lin et al., 2007). Thus, interorganizational exploration enables us to adjust to environmental challenges quickly.

But interorganizational exploitation is critical to use resources more responsibly and collectively, mitigate risk, and foster stability (Grant & Baden-Fuller, 2004). For instance, we assume that developing interorganizational activities in the same sector can enable us to avoid waste because some part of unused resources from one stakeholder can be used by others. Consequently, we argue that interorganizational ambidexterity is crucial to reduce waste and emissions from operations and environmental impacts. Therefore, it favors interorganizational environmental performance. We derive the following hypothesis:

*Hypothesis 7b: Interorganizational ambidexterity relates positively with interorganizational environmental performance.*

## 3.4. Interactions between levels of analysis

### 3.4.1. Interorganizational ambidexterity and company ambidexterity

Ambidexterity can also be resolved inter-organizationally, thanks to external partner firms (Lavie & Rosenkopf, 2006; Wassmer et al., 2017). For instance, Duysters et al. (2019) made an

invaluable contribution to the ambidexterity literature by elucidating the factors that influence ambidexterity by examining the interrelationships among firms in the electronics sector. Viewing a firm only as an independent actor would limit its ability to engage in exploration activities (Duysters et al., 2019). At the interorganizational level, two distinct types of activities can be identified. First, on an exploratory level, companies can engage in reflective practices, such as R&D, discussing new scientific studies, conducting joint testing of innovative solutions, and collectively investing in promising projects. Second, for operational purposes, partners can collaborate to monitor productivity trends and enhance existing practices or processes. We argue that these significant inter-organizational activities can impact internal activities within each organization. And the learning emerging from interorganizational activities can help firms balance their internal activities better. These arguments lead to the following hypothesis:

*Hypothesis 8: Interorganizational ambidexterity relates positively with company ambidexterity.*

### 3.4.2. Company ambidexterity and employee ambidexterity

In addition to intra-level relations, inter-level connections contribute to companies' success. Although ambidexterity is originally an organizational-level phenomenon, several studies have focused on the microfoundational aspects by making individuals responsible for organizational outcomes (Balarezo & Nielsen, 2022; K. Lee & Kim, 2021; Schnellbächer & Heidenreich, 2020). Balarezo & Nielsen (2022) found that ambidexterity is visible at both levels and that ambidextrous individuals contribute to the organizational ambidextrous culture. Although individual ambidexterity remains challenging for employees, it has been argued that ambidextrous individuals necessitate the efficient integration of knowledge to fulfill the organization's requirement for both exploration and exploitation (Taylor & Helfat, 2009). We posit that a firm's ability to act ambidextrously encourages individuals to execute exploration and exploitation simultaneously. We hypothesize that:

*Hypothesis 9: Company ambidexterity relates positively with employee ambidexterity.*

### 3.4.3. Individual environmental consciousness and company environmental performance

Firms face a situation where external stakeholders (including customers) and internal ones (such as employees) are asking for increased and faster engagement in preserving the environment

(Y. Chen et al., 2015). As society becomes more aware of the environment, companies must react. Environmental strategic outcomes have become undeniably critical because of the demand from individual actors (Banerjee et al., 2003). Considering the CSR literature from a microfoundation lens, we argue that micro-level factors support macro-level phenomena. Hence, individual involvement is necessary for organizational results regarding the environment. And individual enthusiasm may help companies reach their environmental targets. As mentioned in previous research, employee involvement in preserving the planet within a business scope of activities may foster their company's environmental performance (del Brío et al., 2007). In other words, we argue that employees contribute to organizational objectives (such as environmental key performance indicators). Therefore, we derive the following hypothesis:

*Hypothesis 10: Individual environmental consciousness relates positively with company environmental performance.*

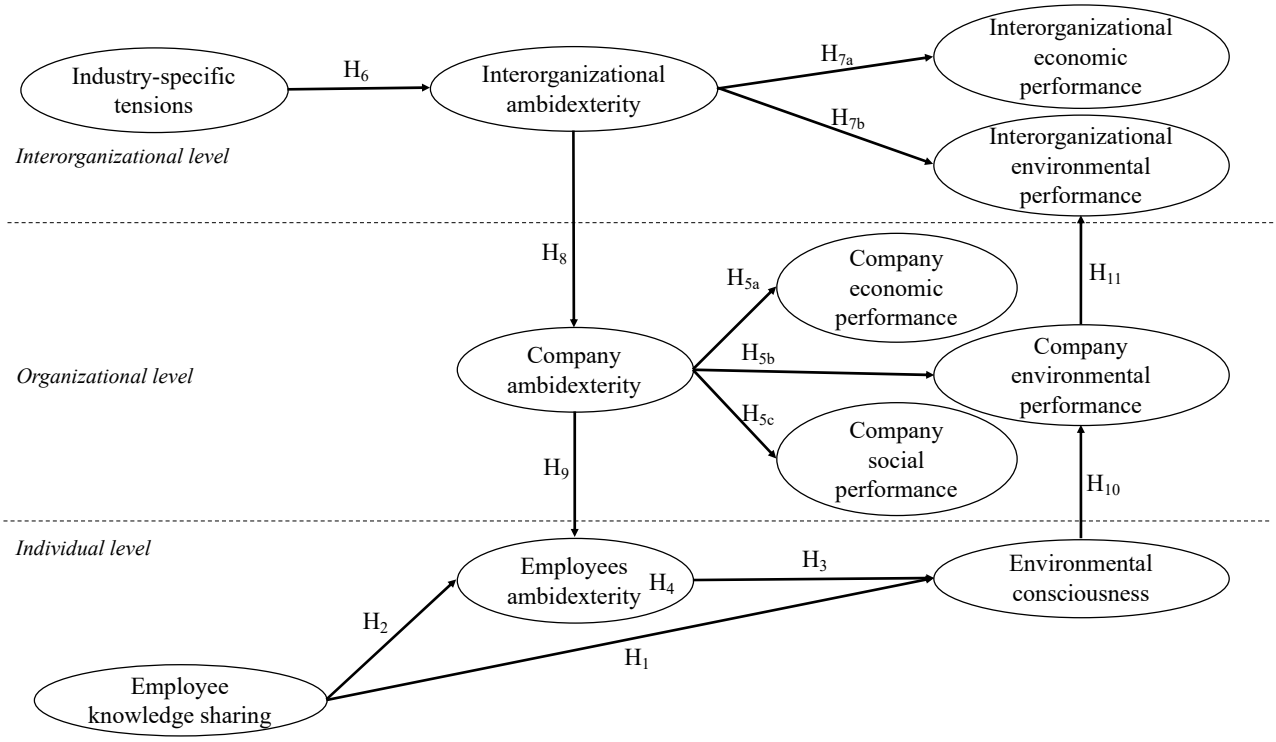
### 3.4.4. Company environmental performance and interorganizational environmental performance

Besides the link between individual environmental consciousness and organizational environmental performance, it is worthwhile to consider scaling organizational environmental performance toward the interorganizational level. Interorganizational environmental performance can be considered the aggregation of organizational performance or the mutual environmental initiatives resulting from partnerships. Like the previous hypothesis (and in line with the microfoundation), we argue that organizational engagement is necessary to contribute to an environmental performance achieved between firms. And this leads us to hypothesize that:

*Hypothesis 11: Company environmental performance relates positively with interorganizational environmental performance.*

Based on the hypothesis development, we present our conceptual model in Figure 6.

Figure 6 : Conceptual model



# 4. Methodology

## 4.1. Questionnaire development

We developed two questionnaires through a multi-stage process following (Churchill, 1979; Anderson & Gerbing, 1988; Hazan & Shaver, 1994; Hazan & Zeifman, 1999): one for the employees (individual level) and one for the CEOs (organizational and inter-organizational levels). We conducted a qualitative preliminary study by interviewing four agricultural experts operating in the algae industry, considering the scales from the literature to build our draft questionnaire. We translated the two questionnaires from English to French and then back-translated them from French to English to ensure consistency. Then we sent our draft questionnaires to six employees and three CEOs from our sample to identify which items were unclear to the respondents and suggest improvements. We received feedback regarding time and ease of response.

## 4.2. Measures

The measures used in this study were validated scales from the literature (see Tables 16, 17, and 18 for item details). The participants responded to the survey indicating their perceptions toward the items measured (except economic performance, an objective variable requiring an exact number).

### 4.2.1. Dependent variables

This study uses a ten-item scale to measure individual *environmental consciousness* as a micro-level dependent variable based on Boiral & Paillé's (2012) instrument.

*Organizational environmental performance* was evaluated using a six-item scale from Zarzycka & Krasodomska (2021). *Organizational social performance* was measured using a three-item scale considering Beisland et al. (2021) and Clark & Sinha (2013). *Organizational economic performanc*e was measured based on the profit per employee generated by companies. We used self-reported continuous data provided by the CEOs because of their

extensive knowledge regarding company performance. Several valuable studies have used self-reported data to measure firm performance (Ambilichu & Yekini, 2022; Lubatkin et al., 2006).

Regarding the higher level, *interorganizational environmental performance* resulting from partnerships was measured based on Paillé et al.'s (2014) five-item scale, while *inter-organizational economic performance* was assessed based on the seven-item scale from Jap (1999) and Jap & Anderson (2003).

### 4.2.2. Independent variables

At the individual level, *employee knowledge sharing* was assessed using Park & Kim's (2022) and Srivastava et al.'s (2006) seven-item scale. *Employee ambidexterity* was measured with Mom et al.'s (2007) scale, also used by Rosing & Zacher (2017), which assessed employees' explorative and exploitative activities. Seven items were employed for exploration and exploitation. Then we multiplied the average of the two scales to measure ambidexterity (Gibson & Birkinshaw, 2004; Mom et al., 2009).

At the organizational level, we assessed *industry-specific tensions* to assess the importance of current challenges in agriculture with seven items (Windsor, 2020). *Organizational ambidexterity* was calculated based on Lubatkin et al.'s (2006) scale. As with employee ambidexterity, the organizational level was the computation of the multiplication between exploitative orientation (six items) and exploratory orientation (six items).

*Interorganizational ambidexterity* was measured with eight items following the conceptualization of Gibson & Birkinshaw (2004).

### 4.2.3. Control variables

Performance may be influenced by factors related to firms' and employees' characteristics. Thus, we used control variables (at the individual, organizational, and interorganizational levels).

At the individual level, we considered six control variables: gender, age, position, education, company experience, and industry experience.

We considered ten control variables at the organizational level. They were firm turnover (to measure the annual revenue and evaluate the resource availability), firm age log, firm size log, type of partners, CEO gender, CEO age, CEO position, CEO education, CEO company experience, and CEO industry experience. According to past literature, firm age impacts innovation performance (Bantel & Jackson, 1989; Rothaermel & Deeds, 2006) based on firm experience (Rothaermel & Boeker, 2008). Consequently, as firms age, they usually focus more on exploiting market opportunities and less on the exploration phase (Katila & Chen, 2008). Firm size also impacts innovation and performance because larger companies frequently possess larger knowledge bases (Lane et al., 2006). We controlled for partner type according to each partner's position in the value chain. Since all the companies are part of the agricultural industry in the algae sector, we did not include industry controls.

At the interorganizational level, we considered five control variables: firm experience with MLA, annual fees paid to MLA, geographical distance from MLA (using their headquarters' ZIP codes), number of MLA partners, and turnover related to MLA activities. These control variables were crucial because all participants' companies were MLA members.

## 4.3. Data collection

We collected data in the field from companies competing in the French algae industry. To develop a precise research setting before collecting data, the authors worked closely with an association called 'Merci les Algues' (MLA) composed of 42 partners. After seven meetings with the association (which lasted between 50 and 90 minutes), we gained insights into the companies' activities and about developing and refining the survey instrument. It was crucial to perform a pre-test because scales were applied in a specific context. A pre-test was performed on 32 people from our sample of employees from the three MLA partners. We checked the reliability of our constructs with Cronbach's Alpha, and it was satisfactory. Therefore, no changes were made between the pre-test and the primary data collection.

The data was collected in France for four months (from February to May 2023). Our data collection was performed using paper and online surveys for the two questionnaires. All 42 MLA partners were contacted to participate in the survey, 36 partners of which responded positively to our requests. However, four partners responded to only the employee or the CEO

survey. Therefore, we did not include their responses. Thirty-two partners responded to employee and CEO surveys. With 32 company respondents from the 42 invitations sent, the response rate was relatively high, with 76.19% of partners participating.

Visiting the MLA partners on-site allowed us to collect data and meet and speak with CEOs and employees. 279 questionnaires were collected on paper, and 25 were collected online, representing 304 employee responses. No significant differences were detected between the online and on-site groups. In addition to practical managerial results used as incentives for the CEOs, seaweed-based cookies were distributed to thank the respondents for responding to the questionnaires.

No data was missing from the dataset. The test of early and late respondents was conducted to detect the non-response bias (Armstrong & Overton, 1977). The average values of the first 10 and 20% of respondents were compared with those of the last 10 and 20% of the respondents, respectively. We do not report any issues suggesting nonresponse bias. Anonymity was assured to avoid self-report bias. However, respondents' names were requested to follow up on their participation and prevent duplicate responses. Our final sample consists of 304 employees and 32 CEOs. At the individual level, we have four constructs comprising 31 items. Therefore, 304 respondents meet the standards regarding sample size for Structural Equation Modeling (SEM). Tables 12, 13, 14, and 15 present descriptive statistics regarding the 304 employees, the 32 CEOs, the 32 companies, and their financial performances, respectively. The average company size is 45 full-time employees. The average company age is 28 years.

Table 12 : Descriptive statistics of the employees

| Dimension | Items | Frequency | Percentage |
|---|---|---|---|
| Gender | Female | 160 | 52.6 |
| | Male | 144 | 47.4 |
| Age | 18–24 | 46 | 15.1 |
| | 25–34 | 108 | 35.5 |
| | 35–44 | 56 | 18.4 |
| | 45–54 | 65 | 21.4 |
| | 55 or above | 29 | 9.5 |
| Education | No diploma | 7 | 2.3 |
| | BTEC or GNVQ equivalent | 24 | 7.9 |
| | High school diploma | 25 | 8.2 |
| | Bachelor's degree | 121 | 39.8 |
| | Master's degree | 123 | 40.5 |
| | Doctorate | 4 | 1.3 |
| Job type | Intern or trainee | 26 | 8.6 |
| | Employee | 150 | 49.3 |
| | Manager | 93 | 30.6 |
| | Executives or senior manager | 22 | 7.2 |
| | Owner, CEO, or associate | 13 | 4.3 |
| Company experience *(in years)* | Less than 1 | 68 | 22.3 |
| | 1–4.9 | 118 | 38.8 |
| | 5–14.9 | 82 | 27.1 |
| | 15 or more | 36 | 11.8 |
| Industry experience *(in years)* | Less than 1 | 30 | 10.0 |
| | 1–4.9 | 84 | 27.8 |
| | 5–14.9 | 112 | 36.7 |
| | 15 or more | 78 | 25.8 |

N=304

Table 13 : Descriptive statistics of the CEOs

| Dimension | Items | Frequency | Percentage |
|---|---|---|---|
| Gender | Female | 4 | 87.5 |
| | Male | 28 | 12.5 |
| Age | 18–34 | 1 | 3.1 |
| | 35–44 | 10 | 31.3 |
| | 45–54 | 10 | 31.3 |
| | 55–64 | 8 | 25.0 |
| | More than 65 years | 3 | 9.4 |
| Education | BTEC or GNVQ equivalent | 1 | 3.1 |
| | High school diploma | 6 | 18.8 |
| | Bachelor's degree | 7 | 21.9 |
| | Master's degree | 18 | 56.3 |
| Job type | Director | 4 | 12.5 |
| | CEO | 16 | 50.0 |
| | Owner | 12 | 37.5 |
| Company experience | Less than 1 | 1 | 3.1 |
| *(in years)* | 1–4.9 | 11 | 34.4 |
| | 5–14.9 | 9 | 28.1 |
| | 15 or more | 11 | 34.4 |
| Industry experience | 1–4.9 | 2 | 6.3 |
| *(in years)* | 5–14.9 | 10 | 31.1 |
| | More than 15 | 20 | 62.5 |

N=32

Table 14 : Descriptive statistics of the companies

| Dimension | Items | Frequency | Percentage |
|---|---|---|---|
| Company type | Farmer | 6 | 18.75 |
| | Harvester or supplier of seaweed-based solutions | 6 | 18.75 |
| | Scientific, academic, and institutional | 1 | 3.13 |
| | Food Processor | 10 | 31.25 |
| | Association | 3 | 9.4 |
| | Agricultural intermediary | 4 | 18.75 |
| | Distributor or caterer | 2 | 6.25 |
| Firm's age *(in years)* | 0–10 | 14 | 43.75 |
| | 11–20 | 3 | 9.4 |
| | 21–30 | 6 | 18.75 |
| | 31–40 | 2 | 6.25 |
| | 41–50 | 1 | 3.13 |
| | 51–100 | 5 | 15.63 |
| | More than 100 | 1 | 3.13 |
| Firm’s size *(in years)* | 1–10 | 18 | 56.25 |
| | 11–50 | 6 | 19.75 |
| | 51–100 | 2 | 6.25 |
| | 101–250 | 4 | 12.5 |
| | 251–1000 | 2 | 6.25 |
| Year of adhesion to MLA | 2020 | 8 | 25.0 |
| | 2021 | 8 | 25.0 |
| | 2022 | 13 | 40.63 |
| | 2023 | 3 | 9.4 |
| Annual sales MLA | Less than 100,000 | 8 | 25.0 |
| *(in euros)* | 100,000–499,999 | 8 | 25.0 |
| | 500,000–999,999 | 5 | 15.63 |
| | 1,000,000–4,999,999 | 6 | 18.75 |
| | More than 5,000,000 | 5 | 15.63 |
| Geographical distance | Less than 50 | 13 | 40.63 |
| MLA *(in km)* | 50–99 | 4 | 12.5 |
| | 100–199 | 7 | 21.88 |
| | 200–499 | 4 | 12.5 |
| | More than 500 | 4 | 12.5 |
| Number of MLA partners | 0–4 | 16 | 50.0 |
| | 5–9 | 10 | 31.25 |
| | 10–14 | 6 | 18.75 |

N=32

Table 15 : Descriptive statistics of the companies' financial performance

| Dimension | Items | Frequency | Percentage |
|---|---|---|---|
| Annual sales | Less than 1,000,000 | 10 | 31.25 |
| *(in euros)* | 1,000,000–4,999,999 | 9 | 28.13 |
| | 5,000,000–9,999,999 | 4 | 12.5 |
| | 10,000,000-49,999,999 | 6 | 19.75 |
| | More than 50,000,000 | 3 | 9.4 |
| Annual sales per employee | Less than 100,000 | 5 | 15.63 |
| *(in euros)* | 100,000–199,999 | 7 | 21.88 |
| | 200,000–299,999 | 9 | 28.13 |
| | 300,000–399,999 | 1 | 3.13 |
| | 400,000–499,999 | 6 | 18.75 |
| | 500,000–599,999 | 0 | 0 |
| | 600,000–699,999 | 1 | 3.13 |
| | 700,000–799,999 | 0 | 0 |
| | 800,000–899,999 | 3 | 9.38 |
| Annual profits | Less than 500,000 | 11 | 34.38 |
| *(in euros)* | 500,000–999,999 | 4 | 12.5 |
| | 1,000,000–4,999,999 | 12 | 37.5 |
| | 5,000,000–49,999,999 | 4 | 12.5 |
| | More than 50,000,000 | 1 | 3.13 |
| Annual profits per | Less than 50,000 | 11 | 34.38 |
| employee *(in euros)* | 50,000–99,999 | 11 | 34.38 |
| | 100,000–149,999 | 2 | 6.25 |
| | 150,000–199,999 | 5 | 15.63 |
| | More than 200,000 | 3 | 9.38 |

N=32

# 5. Analysis

## 5.1. Validity

We executed multiple tests to ensure content validity and construct validity. The constructs' content validity was ensured by asking three academic experts, who agreed that the measurement scales were appropriate for measuring constructs. The content validity was assessed by the literature (Babbie, 2001). All measurement scales are widely used in the literature and taken from five academic journals: the Academy of Management Journal, the Journal of Management Studies, the Journal of Business Ethics, the Journal of Management, and the Journal of Marketing Research. Content validity was also assessed by reliability tests (Rust & Cooil, 1994; Zwick, 1988). And the reliability of the 13 constructs was examined using Cronbach's Alpha.

Cronback's Alpha exceeded 0.70 (Nunnally & Bernstein, 1994) for all constructs: employee knowledge sharing (.880), employee exploration (.914), employee exploitation (.886), employee environmental consciousness (.913), industry-specific tensions (.825), company exploration (.887), company exploitation (.844), company environmental performance (.843), company social performance (.964), interorganizational exploration (.923), interorganizational exploitation (.851), interorganizational economic performance (.872), and interorganizational environmental performance (.921). Those results indicate the acceptable consistency of the measurement items (Nunnally, 1978). We removed two weak items from the construct of interorganizational exploitation because of a low item-to-total correlation. Tables 16, 17, and 18 present the factor loadings and Cronbach's alpha of the constructs related to the individual, organizational, and interorganizational levels of analysis.

## 5.2. Normality and Multicollinearity

Skewness and Kurtosis tests were performed to assess the normal distribution of our data. Skewness indexes are below 3, and the kurtosis indexes are below 10. We also evaluated the absence of multicollinearity with bivariate correlations and the Variance Inflation Factor. We checked that bivariate correlations do not exceed 0.85. In our empirical study, the VIF is below

10. Based on the bivariate correlation and VIF, we can assess the absence of multicollinearity in our data collection. Table 16 presents our constructs' means, standard deviations, and correlations.

Table 16: Factor Loadings and Cronbach's Alpha of constructs at the individual level

| Construct items | Factor loadings | AVE | CR | Cronbach's Alpha |
|---|---|---|---|---|
| **Employee knowledge sharing** | | .515 | .881 | .880 |
| I share my knowledge and expertise with others | .683 | | | |
| If I have some special knowledge about how to perform my task, I am not likely to tell the others about it (R) | .727 | | | |
| There is almost no exchange of information, knowledge, or sharing of skills among colleagues (R) | .691 | | | |
| I am willing to share my hard-to-find knowledge or specialized skills | .698 | | | |
| I help others to do their job | .767 | | | |
| I share lot of information at work with others | .733 | | | |
| I make a lot of suggestions to my colleagues | .721 | | | |
| **Employee exploration** | | .561 | .896 | .914 |
| Searching for new possibilities with respect to products/services, processes, or markets | .882 | | | |
| Evaluating diverse options with respect to products/services, processes, or markets | .92 | | | |
| Focusing on strong renewal of products/services or processes | .868 | | | |
| Activities of which the associated yields or costs are currently unclear | .606 | | | |
| Activities requiring significant adaptability of you | .671 | | | |
| Activities requiring you to learn new skills or knowledge | .598 | | | |
| Activities that are not (yet) clearly existing company policy | .609 | | | |
| **Employee exploitation** | | .504 | .876 | .886 |
| Activities in which you have a lot of experience | .666 | | | |
| Activities which you carry out as if it were routine | .655 | | | |
| Activities which serve existing customers with existing services/products | .73 | | | |
| Activities of which it is clear and simple to conduct | .726 | | | |
| Activities primarily focused on achieving short-term goals | .778 | | | |
| Activities which you can properly conduct by using your present knowledge | .704 | | | |
| Activities which clearly fit into existing company policy | .704 | | | |
| **Employee environmental consciousness** | | .502 | .909 | .913 |
| I spontaneously give my time to help my colleagues take the environment into account in everything they do at work | .652 | | | |
| I encourage my colleagues to adopt more environmentally conscious behavior | .729 | | | |
| I encourage my colleagues to express their ideas and opinions on environmental issues | .691 | | | |
| In my work, I weigh the consequences of my actions before doing something that could affect the environment | .586 | | | |
| I voluntarily carry out environmental actions and initiatives in my daily work activities | .789 | | | |
| I make suggestions to my colleagues about ways to protect the environment more effectively, even when it is not my direct responsibility | .81 | | | |
| I actively participate in environmental events organized in and/or by my company | .6 | | | |
| I undertake environmental actions that contribute positively to the image of my organization | .779 | | | |
| I volunteer for projects, endeavors or events that address environmental issues in my organization | .755 | | | |
| I stay informed of my company's environmental initiatives | .657 | | | |

CMIN /Df = 1.512; CFI = 0.960; IFI = 0.961; TLI = 0.961; RMSEA = 0.041

Table 17 : Factor loadings and Cronbach's Alpha of constructs at the organizational level

| Construct items | Factor loadings | Cronbach's Alpha |
|---|---|---|
| **Company exploration** | | .887 |
| Looks for novel technological ideas by thinking "outside the box" | .642 | |
| Bases its success on its ability to explore new technologies | .844 | |
| Creates products or services that are innovative | .881 | |
| Looks for creative ways to satisfy its customers' needs | .755 | |
| Aggressively ventures into new market segments | .865 | |
| Actively targets new customer groups | .563 | |
| **Company exploitation** | | .844 |
| Commits to improve quality and lower cost | .655 | |
| Continuously improves the reliability of its products and services | .578 | |
| Increases the levels of automation in its operations | .661 | |
| Constantly surveys existing customers' satisfaction | .821 | |
| Fine-tunes what it offers to keep its current customers satisfied | .720 | |
| Enlarges its customer base | .718 | |
| **Company environmental performance** | | .843 |
| We reduce our carbon emissions (electricity, transport, digital) | .769 | |
| We limit at maximum our water consumption | .672 | |
| We adopt a very good management of used water (reusage) | .650 | |
| We are exemplary in terms of raw materials purchase | .575 | |
| We optimize our management of packaging and waste (recycling) | .694 | |
| We invest significatively for preserving the environment (sustainable investment) | .673 | |
| **Company social performance** | | .964 |
| The institution follows a written human resources policy that protects employees and creates a supportive working environment | .904 | |
| The institution communicates to all employees the terms of their employment and provides training for essential job functions | .927 | |
| The institution monitors employee satisfaction and turnover | .933 | |
| **Industry specific tensions** | | .825 |
| Producing quality food | .745 | |
| Guarantying an affordable price for citizen | .801 | |
| Reducing the use of products derived from chemical synthesis (antibiotics, pesticides, additives…) | .748 | |
| Maintaining high production levels | .729 | |
| Adapting to consumers' preferences change | .783 | |
| Continuing to conserve the landscapes, the grasslands and the livestock that graze them | .573 | |
| Reducing carbon emissions | .832 | |

Table 18 : Factor Loadings and Cronbach's Alpha of constructs at the interorganizational level

| Construct items | Factor loadings | Cronbach's Alpha |
|---|---|---|
| **Interorganizational exploration** | | .923 |
| We encourage all employees to challenge out-model traditions/practices/sacred cows | .873 | |
| We are flexible enough to respond quickly to changes in the agricultural and agri-food sectors | .893 | |
| We adapt quickly to market challenges | .904 | |
| Together, we are able to rethink our activities to meet new environmental requirements | .776 | |
| **Interorganizational exploitation** | | .851 |
| We work in a coherent manner to support the overall common objectives | .832 | |
| Our collaborations enable us to use resources more responsibly | .846 | |
| We sometimes have to waste resources on unproductive activities (R) | .810 | |
| **Interorganizational economic performance** | | .872 |
| We have both gained strategic advantage over their competitors | .505 | |
| We have gained benefits that enable them to compete more effectively in the marketplace | .906 | |
| Our relationship has not resulted in strategically important outcomes (R) | .892 | |
| We noticed, that together, our level of profits is higher | .900 | |
| We have generated high joints profits together | .816 | |
| We have increased joint profits shared between them | .910 | |
| **Interorganizational environmental performance** | | .921 |
| We reduce wastes and emissions from operations. | .864 | |
| We reduce the environmental impacts of its products/service | .885 | |
| We reduce environmental impact in a general manner | .943 | |
| We reduce the risk of environmental accidents, spills, and releases | .841 | |
| We reduce purchases of non-renewable materials, chemicals, and components | .861 | |

Table 19 : Means, Standard Deviations, and Correlations

| | | Mean | Standard Deviation | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Employee knowledge sharing | 4.249 | .488 | | | | | | | | | | | | | |
| 2. | Employee exploration | 4.41 | 1.345 | .194** | | | | | | | | | | | | |
| 3. | Employee exploitation | 5.348 | 1.04 | .240** | .310** | | | | | | | | | | | |
| 4. | Employee environmental consciousness | 5.043 | 1.108 | .373** | .323** | .303** | | | | | | | | | | |
| 5. | Industry-specific tensions | 4.678 | .419 | .057 | .049 | -.048 | .074 | | | | | | | | | |
| 6. | Company exploration | 4.388 | .626 | -.020 | .091 | -.101 | -.071 | .381** | | | | | | | | |
| 7. | Company exploitation | 4.6 | .514 | .120* | .137* | .015 | .089 | .792** | .435** | | | | | | | |
| 8. | Company economic performance | 153986 | 147794 | .029 | -.003 | -.126* | -.141* | .430** | .307** | .417** | | | | | | |
| 9. | Company environmental performance | 4.07 | .682 | .044 | .155** | -.068 | -.015 | .426** | .802** | .517** | .535** | | | | | |
| 10. | Company social performance | 6.444 | .838 | .080 | -.003 | -.025 | .023 | .497** | .444** | .633** | .291** | .431** | | | | |
| 11. | Interorganizational exploration | 4.331 | .698 | .117* | .129* | -.055 | .028 | .613** | .773** | .773** | .422** | .719** | .597** | | | |
| 12. | Interorganizational exploitation | 4.419 | .655 | .056 | .107 | -.025 | -.016 | .673** | .562** | .769** | .408** | .547** | .553** | .827** | | |
| 13. | Interorganizational economic performance | 5.096 | 1.147 | .045 | .007 | -.128* | -.083 | .474** | .504** | .536** | .390** | .519** | .446** | .708** | .628** | |
| 14. | Interorganizational environmental performance | 4.112 | .825 | .142* | .149** | .008 | .149** | .648** | .496** | .747** | .559** | .719** | .515** | .687** | .666** | .401** |

**Correlation is significant at the 0.01 level.; *Correlation is significant at the 0.05 level.
N=304

## 5.3. Confirmatory Factor Analysis

We used the Analysis of Moment Structure (AMOS) to conduct SEM, which is widely used in our field of research. For instance, SEM has been used in the following studies: Venugopal et al. (2020) and Ajayi et al. (2017). All the factors from the Confirmatory Factor Analysis (CFA) were above the suggested value of 0.5, which indicated convergent validity (Hair et al., 2006). The measurement model's CFA showed a good fit (CMIN/Df = 1.512, CFI = 0.960, IFI = 0.961, TLI = 0.961, RMSEA = 0.041). The results of the measurement model were favorable in that all items loaded significantly on their appropriate factors. All standardized factor loadings were over 0.5 and highly significant at p-value < 0.001, which indicates good convergent validity among the instruments of each construct (Bagozzi & Yi, 1988). We considered cross-loading and assessed that each measurement item correlates most strongly with its theoretical construct.

CFA was performed to assess the measurement model's reliability, convergent validity, and discriminant validity (Table 16). Cronbach's alpha and composite reliability facilitated the assessment of the construct measures' reliability. The composite reliabilities of all constructs exceed the 0.60 threshold (Bagozzi & Yi, 1988), which ensures our constructs' reliability. In our study, the standardized loadings are above .5 and significant. The results of the measurement model were favorable in that all items loaded significantly on their appropriate factors. In line with Fornell & Larcker (1981), who argued that the Average Variance Extracted should be greater than .50 of the total variance, we assessed the convergent validity of our constructs. We also assessed the discriminant validity by comparing the square root of the constructs' AVEs with the construct correlations (Fornell & Larcker, 1981). The measurement model showed acceptable discriminant validity for all constructs. Considering the CFA results, we assess validity and reliability based on Fornell & Larcker's (1981) recommendations.

Our work refers to Podsakoff & Organ (1986) and Podsakoff et al. (2003) to limit the risk of Common Method Variance. Harman's single-factor test was employed (Podsakoff et al., 2003, p. 889). In our empirical study, the factor explains 19.36% of the variance, which is below the threshold of 50%. Consequently, our data does not suffer significantly from Common Method Variance.

## 5.4. Structural Equation Modeling

We assessed model identification. The chi-square value is 206,753, with a probability level lower than .001. In our model estimation, we used the maximum likelihood estimation. This model estimation is applicable because the model is overidentified (*df* = 128), the observed variables are normally distributed, the latent constructs are normally distributed, and we have over 90 observations (*N* = 304) and over ten observations per measured variable. We assessed the measurement model's validity. Our CMIN/DF equals 1.615, which is a good fit. The CMIN/DF is acceptable, as it should be below 5 and (preferably) below 3 (Hu & Bentler, 1999). To overcome this small sample-size issue, we also considered the goodness of fit index, which equals .929. Our root-mean-square error of approximation (RMSEA) equals .045, which assesses a good fit below .06 (Hu & Bentler, 1999). As Bagozzi and Yi (1988) recommended, we used multiple fit indices. Our comparative fit index (CFI = .971) and incremental fit index (IFI = .971) are above .9, which refers to a good model fit (Arbuckle & Wothke, 1995). Those results support the overall validity of the constructs measured in the study. Our model's fit is good; therefore, we analyze maximum likelihood estimates.

## 5.5. Mediation of individual ambidexterity

We used Baron & Kenny's (1986) procedure to test the mediation effects in our model (Table 20). Furthermore, to test the hypotheses, we used the maximum likelihood estimation procedure (Ping, 1996). In Model 1, we introduced the control variables: employee gender, employee age, employee position, employee education, the employee's company experience, and the employee's industry experience. We note that only employee position is significant. In the first step (Model 2), we note that employee knowledge sharing relates positively with employee environmental consciousness (.418***), supporting H1. In the second step (Model 3), our results indicate that employee knowledge sharing and employee ambidexterity relate positively (.206***), supporting H2. In the third step (Model 4), we confirm the relationship between employee ambidexterity and employee environmental consciousness (.414***) and H3. In the fourth step (Model 5), we introduce the independent variable (employee knowledge sharing), the mediator (employee ambidexterity), and the dependent variable (employee environmental consciousness). The paths between the independent variable, employee knowledge sharing, and

the mediator, employee ambidexterity, and between the mediator, employee ambidexterity, and the dependent variable, employee environmental consciousness, and between the independent variable, employee knowledge sharing, and the dependent variable, employee environmental consciousness, are all positive and significant (.269***, .33***, and .344***, respectively). We note that the significance of all three hypotheses remains, suggesting a partial mediation of employee ambidexterity on the relationship between employee knowledge sharing and employee environmental consciousness because the direct and indirect effects are significant (Zhao et al., 2010).

Besides Baron & Kenny's (1986) approach, we used a bootstrap mediation test to analyze the mediation effect (Hayes, 2013; Preacher & Hayes, 2008) with 95 Bias corrected intervals. We used the bootstrap method to avoid problems of non-normality (Preacher & Hayes, 2008; Zhao et al., 2010). As a non-parametric method based on resampling, bootstrapping for testing the indirect effect is common (Bollen & Stine, 1990; Shrout & Bolger, 2002). We measured a direct effect of employee knowledge sharing on employee environmental consciousness (0.344***) and an indirect effect of employee knowledge sharing on employee environmental consciousness (0.089***). Thus, the total effect of employee knowledge sharing on employee environmental consciousness is equal to the sum of the direct and indirect effects, 0.433***. Hence, we conclude that employees' ambidexterity partially mediates the relationship between employee knowledge sharing and employee environmental consciousness. Therefore, we support H4.

Table 20 : Mediating role of employees' ambidexterity

| | | | | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|---|---|---|---|---|---|---|---|
| | **Description of path** | | | | | | | |
| $H_1$ | Employee knowledge sharing | → | Employee environmental consciousness | | .418*** | | | .344*** |
| $H_2$ | Employee knowledge sharing | → | Employees ambidexterity | | | .206*** | | .269*** |
| $H_3$ | Employee ambidexterity | → | Employee environmental consciousness | | | | .414*** | .33*** |
| | **Control variables** | | | | | | | |
| | Employee gender | | | -.037 n.s. | .007 n.s. | -.134** | .029 n.s. | .055 n.s. |
| | Employee age | | | .024 n.s. | .032 n.s. | -.203*** | .112* | .103* |
| | Employee position | | | .18** | .135* | .281*** | .051 n.s. | .035 n.s. |
| | Employee education | | | .012 n.s. | .004 n.s. | .025 n.s. | -.001 n.s. | -.006 n.s. |
| | Employee's company experience | | | -.006 n.s. | .036 n.s. | -.088 n.s. | .04 n.s. | .066 n.s. |
| | Employee's industry experience | | | .066 n.s. | .055 n.s. | .198*** | -.021 n.s. | -.015 n.s. |
| | **Model fit statistics** | | | | | | | |
| | $X^2$ | | | 686,316 | 885,837 | 623,919 | 740,045 | 938,528 |
| | d.f. | | | 99 | 224 | 77 | 114 | 245 |
| | CMIN /Df | | | 6.932 | 3.955 | 8.103 | 6.492 | 3.831 |
| | GFI | | | .767 | .787 | .754 | .765 | .785 |
| | CFI | | | .736 | .795 | .633 | .729 | .791 |
| | IFI | | | .738 | .797 | .636 | .731 | .793 |
| | NFI | | | .707 | .746 | .605 | .697 | .738 |
| | RMSEA | | | .140 | .099 | .153 | .135 | .097 |

* p<.05
** p<.01
*** p<.001
n.s.: not significant

## 5.6. Organizational ambidexterity and performance: The CEO perspective

At the organizational level, we considered the responses of the 32 CEOs. We used SPSS to compute the regression analysis (Table 21). In Model 6, we argue that company ambidexterity does not relate with company economic performance (-.039 n.s.). Our data does not support H5a. In Model 7, we argue that company ambidexterity and company environmental performance relate positively (.812***), supporting H5b. In Model 8, our results indicate that company ambidexterity does not relate with company social performance (.236 n.s.). Therefore, we do not support H5c.

Table 21 : Organizational ambidexterity and performance from CEOs' perspective

| | | | | Model 6 | Model 7 | Model 8 |
|---|---|---|---|---|---|---|
| | **Description of path** | | | | | |
| $H_{5a}$ | Cie ambidexterity | → | Cie economic performance | -.039 n.s. | | |
| $H_{5b}$ | Cie ambidexterity | → | Cie environmental performance | | .812*** | |
| $H_{5c}$ | Cie ambidexterity | → | Cie social performance | | | .236 n.s. |
| | **Control variables** | | | | | |
| | Cie size | | | -.052 n.s. | -.04 n.s. | .583* |
| | Cie age | | | -.333 n.s. | .239 n.s. | -.434 n.s. |
| | Cie MLA type | | | -.308 n.s. | -.096 n.s. | -.13 n.s. |
| | Cie CEO gender | | | -.012 n.s. | .214 n.s. | .396 n.s. |
| | Cie CEO age | | | .11 n.s. | .415 n.s. | .244 n.s. |
| | Cie CEO position | | | .209 n.s. | .146 n.s. | -.125 n.s. |
| | Cie CEO education | | | -.204 n.s. | -.088 n.s. | -.191 n.s. |
| | Cie CEO company experience | | | -.033 n.s. | -.482* | .104 n.s. |
| | Cie CEO industry experience | | | -.127 n.s. | -.061 n.s. | -.071 n.s. |
| | Cie turnover | | | .548* | .189 n.s. | -.095 n.s. |
| | **Model fit statistics** | | | | | |
| | R | | | .596 | .847 | .703 |
| | R2 | | | .356 | .718 | .494 |
| | Adjusted R2 | | | .001 | .562 | .215 |

* p<.05
** p<.01
*** p<.001
n.s.: not significant

## 5.7. Organizational ambidexterity and performance: Aggregation of individuals

From a multilevel perspective, we assessed the organizational ambidexterity by computing the average per firm of individual ambidexterity of employees. We conducted the same analysis as in 5.6. to provide robustness to our findings (Table 22). And this shows that the results are unchanged. Model 9 indicates that company ambidexterity does not relate with company economic performance (-.376 n.s.). Our data does not support H5a. In Model 10, we argue that company ambidexterity and company environmental performance relate positively (.543**), supporting H5b. In Model 11, our results indicate that company ambidexterity does not relate with company social performance (-.097 n.s.). Therefore, we do not support H5c.

Table 22 : Organizational ambidexterity aggregated and performance from CEOs' perspective

| | | | | Model 9 | Model 10 | Model 11 |
|---|---|---|---|---|---|---|
| | **Description of path** | | | | | |
| $H_{5a}$ | Cie ambidexterity | → | Cie economic performance | -.376 n.s. | | |
| $H_{5b}$ | Cie ambidexterity | → | Cie environmental performance | | .543** | |
| $H_{5c}$ | Cie ambidexterity | → | Cie social performance | | | -.097 n.s. |
| | **Control variables** | | | | | |
| | Cie size | | | -.185 n.s. | .228 n.s. | .573* |
| | Cie age | | | -.22 n.s. | -.315 n.s. | -.532* |
| | Cie MLA type | | | -.21 n.s. | -.143 n.s. | -.074 n.s. |
| | Cie CEO gender | | | -.106 n.s. | .416* | .393 n.s. |
| | Cie CEO age | | | .192 n.s. | .337 n.s. | .279 n.s. |
| | Cie CEO position | | | .329 n.s. | .264 n.s. | 0 n.s. |
| | Cie CEO education | | | -.248 n.s. | -.071 n.s. | -.218 n.s. |
| | Cie CEO company experience | | | -.23 n.s. | .151 n.s. | .167 n.s. |
| | Cie CEO industry experience | | | -.071 n.s. | -.073 n.s. | -.034 n.s. |
| | Cie turnover | | | .551* | .173 n.s. | -.098 n.s. |
| | **Model fit statistics** | | | | | |
| | R | | | .679 | .76 | .686 |
| | R2 | | | .461 | .577 | .47 |
| | Adjusted R2 | | | .164 | .345 | .179 |

* p<.05
** p<.01
*** p<.001
n.s.: not significant

## 5.8. Interorganizational ambidexterity

We assessed the relationship between industry-specific challenges, interorganizational ambidexterity, and performance in Table 23. In Model 12, industry-specific challenges relate with interorganizational ambidexterity (.274*), supporting H6. In Model 23, our data does not support H7a: interorganizational ambidexterity does not relate with interorganizational economic performance (.365 n.s.). In contrast, in Model 14, interorganizational ambidexterity relates positively with interorganizational environmental performance (.721***). Therefore, we support H7b.

Table 23 : Interorganizational ambidexterity and performance

| | | | | Model 12 | Model 13 | Model 14 |
|---|---|---|---|---|---|---|
| | **Description of path** | | | | | |
| $H_6$ | Industry-specific challenges | → | Interorganizational ambidexterity | .374* | | |
| $H_{7a}$ | Interorganizational ambidexterity | → | Interorganizational economic performance | | .365 n.s. | |
| $H_{7b}$ | Interorganizational ambidexterity | → | Interorganizational environmental performance | | | .721*** |
| | **Control variables** | | | | | |
| | Sales MLA | | | -.189 n.s. | -.197 n.s. | .02 n.s. |
| | Experience MLA | | | -.421 n.s. | -.197 n.s. | .058 n.s. |
| | Fees MLA | | | -.046 n.s. | -.086 n.s. | -.187 n.s. |
| | Geo distance MLA | | | .081 n.s. | -.068 n.s. | .064 n.s. |
| | Number partners MLA | | | .437* | .222 n.s. | .073 n.s. |
| | **Model fit statistics** | | | | | |
| | R | | | .596 | .56 | .766 |
| | R2 | | | .355 | .313 | .587 |
| | Adjusted R2 | | | .201 | .149 | .488 |

* p<.05
** p<.01
*** p<.001
n.s.: not significant

## 5.9. Multilevel ambidexterity: Organizational and interorganizational bathtub

We assessed the relationships between ambidexterity and environmental performance at the interorganizational and organizational levels in Table 24. In Model 15, we support H8. We note that the relationship between interorganizational ambidexterity and company ambidexterity is significant (.86***). In Model 16, company ambidexterity relates with company environmental performance (.812***). Therefore, we support H5b. In Model 17, company environmental performance and interorganizational environmental performance positively relate (.7***), supporting H11. Finally, in Model 18, interorganizational ambidexterity relates with interorganizational environmental performance (.721***), supporting H7b. Therefore, the microfoundation between interorganizational and organizational levels on ambidexterity and environmental performance holds, suggesting that the macro phenomenon can be explained by looking at micro-level determinants, according to the bathtub model.

Table 24 : Company and interorganizational ambidexterity

| | | | | Model 15 | Model 16 | Model 17 | Model 18 |
|---|---|---|---|---|---|---|---|
| | **Description of path** | | | | | | |
| $H_8$ | Interorganizational ambidexterity | → | Cie ambidexterity | .86*** | | | |
| $H_{5b}$ | Cie ambidexterity | → | Cie environmental performance | | .812*** | | |
| $H_{11}$ | Cie environmental performance | → | Interorganizational environmental performance | | | .7*** | |
| $H_{7b}$ | Interorganizational ambidexterity | → | Interorganizational environmental performance | | | | .721*** |
| | **Control variables** | | | | | | |
| | Cie size | | | -.044 n.s. | -.04 n.s. | | |
| | Cie age | | | .032 n.s. | .239 n.s. | | |
| | Cie MLA type | | | .05 n.s. | -.096 n.s. | | |
| | Cie CEO gender | | | -.046 n.s. | .214 n.s. | | |
| | Cie CEO age | | | .093 n.s. | .415 n.s. | | |
| | Cie CEO position | | | .12 n.s. | .146 n.s. | | |
| | Cie CEO education | | | .207 n.s. | -.088 n.s. | | |
| | Cie CEO company experience | | | .02 n.s. | -.482* | | |
| | Cie CEO industry experience | | | .046 n.s. | -.061 n.s. | | |
| | Cie turnover | | | -.019 n.s. | .189 n.s. | | |
| | Sales MLA | | | | | .165 n.s. | .02 n.s. |
| | Experience MLA | | | | | .035 n.s. | .058 n.s. |
| | Fees MLA | | | | | -.27 n.s. | -.187 n.s. |
| | Geo distance MLA | | | | | -.025 n.s. | .064 n.s. |
| | Number partners MLA | | | | | .119 n.s. | .073 n.s. |
| | **Model fit statistics** | | | | | | |
| | R | | | .88 | .847 | .743 | .766 |
| | R2 | | | .775 | .718 | .552 | .587 |
| | Adjusted R2 | | | .651 | .562 | .445 | .488 |

* p<.05, ** p<.01, *** p<.001, n.s.: not significant

## 5.10. Multilevel ambidexterity: Individual and organizational interactions

Then, we assessed the relationships between ambidexterity and environmental performance at individual and organizational levels in Table 25. Model 19 does not support H9. We note that the relationship between company ambidexterity and individual ambidexterity is not significant (.273 n.s.). In Model 20, employee ambidexterity relates with employee environmental consciousness (.474*). Therefore, we support H3. In Model 21, employee environmental consciousness and company environmental performance do not relate (.254 n.s.), which does not uphold H10. Finally, in Model 22, company ambidexterity relates with company environmental performance (.812***), supporting H5b. Therefore, the microfoundation between organizational and individual levels on ambidexterity and environmental performance does not hold. While the relationships exist within a given level of analysis, cross-level relationships are not supported between the individual and organizational levels.

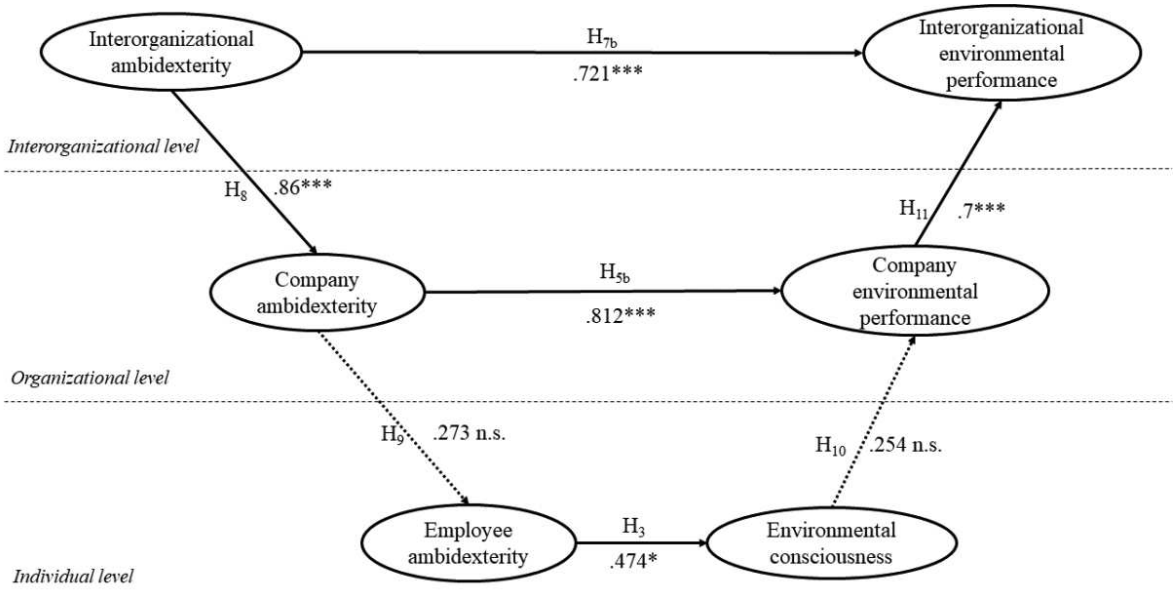
Table 25 : Employee and organizational ambidexterity

| | | | | Model 19 | Model 20 | Model 21 | Model 22 |
|---|---|---|---|---|---|---|---|
| | **Description of path** | | | | | | |
| $H_9$ | Cie ambidexterity | → | Employees Ambidexterity | .273 n.s. | | | |
| $H_3$ | Employees Ambidexterity | → | Employee environmental consciousness | | .474* | | |
| $H_{10}$ | Employee environmental consciousness | → | Cie environmental performance | | | .254 n.s. | |
| $H_{5b}$ | Cie ambidexterity | → | Cie environmental performance | | | | .812*** |
| | **Control variables** | | | | | | |
| | Employee gender | | | .009 n.s. | -.02 n.s. | | |
| | Employee age | | | -.136 n.s. | .09 n.s. | | |
| | Employee position | | | .537* | -.27 n.s. | | |
| | Employee education | | | -.078 n.s. | .163 n.s. | | |
| | Employee's company experience | | | .011 n.s. | .393 n.s. | | |
| | Employee's industry experience | | | .05 n.s. | .106 n.s. | | |
| | Cie size | | | | | .062 n.s. | -.04 n.s. |
| | Cie age | | | | | -.174 n.s. | .239 n.s. |
| | Cie MLA type | | | | | -.054 n.s. | -.096 n.s. |
| | Cie CEO gender | | | | | .306 n.s. | .214 n.s. |
| | Cie CEO age | | | | | .4 n.s. | .415* |
| | Cie CEO position | | | | | .39 n.s. | .146 n.s. |
| | Cie CEO education | | | | | -.119 n.s. | -.088 n.s. |
| | Cie CEO company experience | | | | | -.118 n.s. | -.482* |
| | Cie CEO industry experience | | | | | .007 n.s. | -.061 n.s. |
| | Cie turnover | | | | | .232 n.s. | .189 n.s. |
| | **Model fit statistics** | | | | | | |
| | R | | | .616 | .663 | .636 | .847 |
| | R2 | | | .38 | .439 | .405 | .718 |
| | Adjusted R2 | | | .199 | .276 | .077 | .562 |

* p<.05; ** p<.01, *** p<.001, n.s.: not significant

Based on Tables 24 and 25, we present the multilevel findings in Figure 7.

Figure 7 : Double bathtub model of ambidexterity and environmental performance



# 6. Discussion

Our results shed light on the relationship between multilevel — individual, organizational, and interorganizational — ambidexterity and economic, environmental, and social performance. Our results extend previous research in four ways.

## 6.1. Individual ambidexterity: The mediating role between knowledge sharing and environmental consciousness

The individual-level findings support Park & Kim's (2022) results, which demonstrate employee knowledge sharing's positive impact on exploitation and exploration. However, these results contradict Caniëls et al.'s (2017) findings, which did not find an effect of knowledge sharing on ambidexterity. Nonetheless, our argument suggests that employees in SMEs can perform conflicting activities by overcoming obstacles identified by Gupta et al. (2006) and creating synergies between exploration and exploitation.

Our findings diverge from the argument Ambilichu & Yekini (2022) introduced: that SMEs, constrained by limited resources, cannot afford to let employees choose their contributions to the company, especially concerning exploration and exploitation activities. Instead, we present a more nuanced perspective, suggesting that employees may have some freedom to allocate their time between exploration and exploitation activities based on the company's specific context. Our research provides evidence that exploration and exploitation activities are not mutually exclusive and, when combined, relate positively with employee environmental involvement.

Building upon Mom et al.' (2015) proposition that individual knowledge influences their approach toward exploration within an organization, we further investigated the influence of knowledge sharing among individuals as a potential antecedent to individual ambidexterity and environmental consciousness. While previous studies have linked knowledge sharing to Corporate Social Responsibility (CSR) practices (Gangi et al., 2019), limited evidence exists regarding its relationship with environmental consciousness. Our study suggests that employee knowledge sharing not only directly influences environmental consciousness but also indirectly relates with it

through individual ambidexterity, thus supporting the statement that individual ambidexterity partially mediates the relationship between employee knowledge sharing and environmental consciousness.

## 6.2. Organizational ambidexterity: Positive for environmental performance but not for economic and social performances

Regarding the organizational consequences of ambidexterity, there is a widespread agreement that ambidextrous organizations outperform those focused only on exploration or exploitation. Numerous studies have provided evidence supporting this claim using financial performance or productivity as the primary measure (Ambilichu & Yekini, 2022; Yu et al., 2013). However, our study results differ from our initial expectations and Lubatkin et al.'s (2006), He & Wong's (2004), Vrontis et al.'s (2017), and Yu et al.'s (2020). past findings. Surprisingly, we did not find support for the relationship between organizational ambidexterity and economic performance.

The absence of a significant relationship between organizational ambidexterity and economic performance may be attributed to the various performance indicators previous studies used. These studies employed metrics such as operating margin (Wassmer et al., 2017), return on invested capital profit (Hsu et al., 2013), return on equity (Luger et al., 2018), sales growth (He & Wong, 2004), or other subjective measures (Lubatkin et al., 2006; Pertusa-Ortega & Molina-Azorín, 2018). In line with Guest et al.'s (2003) and Lowell's (2007) perspectives on corporate performance, we used profit per employee as a precise and meaningful indicator to effectively measure productivity. Surprisingly, our findings show that organizational ambidexterity does not relate with profit per employee, presenting a counterintuitive outcome. Consequently, we recommend further research with larger sample sizes to confirm or challenge our results and shed more light on this relationship.

The current results indicate that organizational ambidexterity relates with environmental performance but does not seem to influence economic or social performance. Unlike previous studies (which treated the social aspect as a characteristic or antecedent of social capital), we

viewed it as an outcome of ambidexterity, aligning with Hahn et al. (2016). As per Anzola-Román et al. (2023) work, which explored CSR's effects on innovative performance, our findings do not reveal any significant relationship between organizational ambidexterity and social performance.

Unlike economic and social performance, our findings reveal a positive relationship between ambidexterity and environmental performance at the organizational level. This empirical evidence highlights that a firm's ability to excel simultaneously in exploration and exploitation activities is advantageous for environmental preservation and reducing the organization's negative impact on the planet. Ambidexterity empowers firms to balance forward-thinking and resource conservation, supporting sustainable practices. The result aligns with our expectations, given that the companies involved in the MLA association actively participate in a virtuous ecosystem that utilizes algae to mitigate environmental impacts. However, to ensure our findings' broader applicability, further validation in less environmentally-friendly ecosystems would be valuable.

Our study indicates a positive relationship between organizational ambidexterity and environmental performance. However, we did not find significant relationships between organizational ambidexterity and economic or social performance. And this contradicts the argument introduced by Anzola-Román et al. (2023), who suggested that environmental actions lead to increased profit margins due to reduced costs associated with resource consumption, energy usage, or harmful material usage. Based on our empirical findings, we assert that it is essential to treat each aspect of the TBL independently and recognize its unique implications for organizational performance.

## 6.3. Interorganizational ambidexterity under industry-specific tensions: Positive for interorganizational environmental performance but not for economic performance

Our research expands upon the existing body of work on interorganizational ambidexterity from a multilevel perspective, which has been explored in five previous studies (Karamanos, 2012; Li & Wang, 2019; Pereira et al., 2021; Russo & Vurro, 2010; Barrutia & Echebarria, 2019). Our study

introduces two additional levels: organizational and individual ambidexterity, which represents a novel contribution to multilevel ambidexterity research.

Our findings demonstrate that interorganizational ambidexterity relates positively with environmental performance through collaborative efforts among companies. Our study complements Zimmermann et al.'s (2015) work on interorganizational partnerships by providing critical insights into the benefits of ambidexterity in interorganizational settings. By accessing external resources and knowledge through collaborations, organizations can share virtuous practices for environmental sustainability. As a result, interorganizational relationships play a crucial role in enabling all stakeholders within the ecosystem to act more sustainably.

Contrary to our expectations, our study reveals that, like at the organizational level, interorganizational ambidexterity does not show a significant relationship with interorganizational economic performance. This finding may appear counterintuitive, as collaborating with other entities is often considered economically advantageous. While previous studies have generally indicated a positive link between firm alliance counts and performance (Baum, Calabrese, et al., 2000; Powell et al., 1996), our results align more closely with Goerzen's (2007) and Goerzen's (2007) findings, suggesting that forming alliances with companies with strong interconnections may lead to negative effects on firm performance. The social ties between Merci les Algues' partners could be contributing to counterproductive interorganizational economic performance outcomes. This result underscores the importance of examining the complexities of interorganizational relationships and their potential impact on economic outcomes, as they may not always follow the conventional expectation of positive effects from collaboration.

When evaluating the consequences of interorganizational ambidexterity regarding economic and environmental outcomes, considering the industry-specific tensions that may either promote or hinder companies from practicing ambidexterity is essential. Building on Li & Wang's (2019) insights, our research incorporates level-specific tensions (including industry-specific ones) to broaden the scope of past studies and gain a more comprehensive understanding of interorganizational ambidexterity. By studying the agriculture industry, we offer a unique

perspective distinct from previous research, which predominantly focused on innovation-intensive sectors. This approach aligns with Pertusa-Ortega et al.'s (2020) and Hughes et al.'s (2020) calls urging exploration in non-conventional industries less driven by technology and research and development. Examining ambidexterity in such settings allows us to address a broader range of contexts and enrich our knowledge about ambidexterity's implications across various industries.

In agribusiness, unique challenges specific to the algae sector significantly impact all industry stakeholders. Our study reveals that the perception of these industry-specific challenges plays a crucial role in driving interorganizational ambidexterity. When companies confront these tensions, they are more motivated to embrace interorganizational ambidexterity, leveraging their partners' capabilities and expertise to complement their own exploration or exploitation activities. This approach encourages stakeholders to specialize in distinct parts of the value chain and form strategic partnerships to achieve interorganizational ambidexterity. For SMEs, in particular, interorganizational ambidexterity becomes a vital pursuit. As per Ajayi, Odusanya, and Morton's (2017), Kiss et al.'s (2020), and Venugopal et al.'s (2020) research, we contribute to studying ambidexterity in SMEs, which differs substantially from ambidexterity in multinational enterprises (Christofi et al., 2021). Our observations indicate that SMEs actively seek to develop partnerships with other firms to harness interorganizational ambidexterity, even though the interorganizational economic performance outcomes did not exhibit significant confirmation, unlike interorganizational environmental performance.

## 6.4. Inter-level interactions: Higher bathtub prevails on lower bathtub

Our study adopts a pioneering approach to investigate the interrelations between organizational and interorganizational ambidexterity (higher-level bathtub) and individual and organizational ambidexterity (lower-level bathtub). We utilize a unique double-bathtub model to examine these dynamics across three distinct levels.

We contend that a higher-level bathtub exists (as evidenced by the connections between organizational and interorganizational levels). First, we observe a positive top-down relationship,

indicating that interorganizational ambidexterity relates positively with organizational ambidexterity. Second, at the intra-organizational level, we find a positive relationship between organizational ambidexterity and company environmental performance. Third, a bottom-up relationship is evident, showing a positive link between company environmental performance and interorganizational environmental performance. Last, at the intra/interorganizational level, we confirm the relationship between interorganizational ambidexterity and interorganizational environmental performance. These interconnections demonstrate the complex interplay between various levels of ambidexterity and their impact on environmental performance.

In contrast, our findings do not provide evidence of a lower-level bathtub. None of the inter-level interactions demonstrated significance, including the top-down relationship between company ambidexterity and individual ambidexterity and the bottom-up relationship between individual environmental consciousness and company environmental performance. Surprisingly, the interactions between company ambidexterity and its lower-level counterpart, individual ambidexterity, turned out to be nonsignificant. Moreover, our data did not support that organizational performance can be grounded solely at the individual level. As a result, we are uncertain about the contribution of individual environmental consciousness to company environmental performance. It appears that individuals, as nested systems, do not explain a significant variance at the firm level. These non-findings emphasize the need for further investigation, following the suggestions of Tempelaar & Rosenkranz (2019), using a larger sample to explore the microfoundation of ambidexterity and its relationship with environmental performance more profoundly.

Our study's lack of significant inter-level relationships could be partially attributed to our data's cross-sectional nature. Organizational ambidexterity requires time to permeate down to the individual level. And similarly, it takes time for improvements in individual performance to manifest at the organizational level. Hence, there might be a time lag between the antecedents and the outcomes in multilevel studies. Furthermore, the non-finding might also be influenced by the characteristics of the individuals surveyed.

Unlike previous studies, which primarily focused on top management employees at higher hierarchical levels (Mom et al., 2009) or frontline managers handling exploration-exploitation tensions (Zimmermann et al., 2018), our research examined regular employees to determine whether organizational ambidexterity relates with individual ambidexterity. However, our findings suggest no significant relationship between organizational ambidexterity and individual ambidexterity in regular employees. And this could be attributed to the fact that regular employees focus primarily on their daily tasks, regardless of the firm's exploration, exploitation, or ambidexterity strategies. This non-finding aligns with a limited number of studies that have explored the perspective of non-managerial employees, such as Kauppila and Tempelaar's (2016) research, and extends the investigation to the individual, organizational, and interorganizational levels.

Examining three levels of analysis allows us to address Junni et al.'s (2013) argument, which is based on a meta-analysis stating that the positive impact on performance diminishes as we move down the levels of observation (though it remains present). When considering environmental performance, which differs significantly from regular economic performance (frequently studied), we concur with this statement at the individual and organizational levels. The relationship between company ambidexterity and company environmental performance is stronger than the relationship between employee ambidexterity and individual environmental consciousness. However, the reverse is true when comparing organizational and interorganizational levels. Our data indicate that the relationship between company ambidexterity and company environmental performance is slightly stronger than the relationship between interorganizational ambidexterity and interorganizational environmental performance. Consequently, organizational ambidexterity appears to relate more strongly with organizational environmental performance, followed by the interorganizational level, then the individual level.

# 7. Conclusion

## 7.1. Contributions

Our study contributes to theory and practice by highlighting the interplay between employee, company, and interorganizational ambidexterity respecting environmental performance while showing no significant relationship with economic and social performance.

First, we enhance the understanding of individual ambidexterity by building upon the works of Mom, van Den Bosch, & Volberda (2009), Rogan & Mors (2014), and Tempelaar and Rosenkranz (2019). Inspired by the microfoundation concept proposed by Felin and Foss (2005) and complementing Gibson and Birkinshaw (2004), we demonstrate that knowledge sharing can motivate employees to develop increased ambidexterity. By establishing individual ambidexterity as a partial mediator, we unravel the connections between individual ambidexterity, knowledge sharing, and environmental consciousness, a novel aspect within the ambidexterity field. And this complements the research Rosing & Zacher (2017) and J. A. Zhang et al. (2020) conducted, which explored outcomes such as creativity and performance. Moreover, we argue that individual ambidexterity positively influences individuals' environmental awareness and involvement, thereby contributing to Aguilera et al.'s (2021) call for further investigations into employees' contributions to environmental concerns.

Our second contribution centers on the outcomes of multilevel ambidexterity, encompassing the TBL perspective. Specifically, we expand the scope of organizational ambidexterity by incorporating social and environmental performances alongside economic performance, which form integral components of the TBL. Our examination of overall organizational performance aligns with George et al.'s (2016) call. We introduce a debate by not supporting the relationship between organizational ambidexterity and economic performance, thus challenging the well-established belief held by Lubatkin et al. (2006), He & Wong (2004), Vrontis et al. (2017), and Yu et al. (2020), and others. Moreover, we also contribute to organizational ambidexterity by proposing that ambidextrous organizations perform better concerning environmental performance

than their counterparts. And this insight is further supported by our findings at the interorganizational level, where interorganizational ambidexterity shows no significant relationship with interorganizational economic performance but exhibits a positive link with interorganizational environmental performance. These results add to Zimmermann et al.'s (2015) work in exploring the benefits of interorganizational ambidexterity and contribute to the growing body of empirical studies incorporating the interorganizational level in multilevel ambidexterity, as highlighted by Li & Wang (2019), Pereira et al. (2021), and Barrutia & Echebarria (2019).

Third, in alignment with March's (1991) perspective, our study sheds light on nested systems (encompassing individual, organizational, and interorganizational levels) striving to achieve a balanced integration of exploration and exploitation within a multilevel framework. We contribute to the microfoundational understanding of inter-level relationships, focusing on ambidexterity and performance, as highlighted by Felin et al. (2015). Utilizing a double-bathtub model, we take a comprehensive approach, embracing the connections between individual and organizational ambidexterity and between organizational and interorganizational ambidexterity. And this complements the top-down and bottom-up approach to performance discussed in Henriques & Richardson's (2004) study. Our findings affirm a robust relationship between organizational and interorganizational inter-level interactions. However, we encountered a lack of empirical evidence supporting the relationship between employee and company inter-level interactions. As a result, our research adds value to Hitt, Beamish, Jackson, & Mathieu's (2007) work as we explore the nested arrangements within a single firm and extend our examination to interactions across organizations (a relatively novel aspect). And this contributes directly to the growing demand for more comprehensive studies incorporating multiple levels of analysis, as advocated by García-Granero, Fernández-Mesa, Jansen, and Vega-Jurado (2018) and Pertusa-Ortega, Molina-Azorín, Tarí, Pereira-Moliner, and López-Gamero (2020). Furthermore, our study unravels the complexities of organizational ambidexterity, a multifaceted phenomenon nurtured across various hierarchical levels. This valuable contribution aligns with the works of Raisch and Birkinshaw's (2008a), Simsek's (2009), and Tarba, Jansen, Mom, Raisch, & Lawton (2020). We gain insights into interconnected systems within organizations, exploring the microfoundational perspective at the individual level (Balarezo & Nielsen, 2022) and extending the limited empirical studies on

interorganizational ambidexterity (Lavie & Rosenkopf, 2006) to include interactions across organizations.

Apart from the theoretical contributions, our study yields valuable managerial implications. First, it emphasizes the significance of incorporating ambidexterity to enhance environmental performance. Companies can effectively boost their environmental engagement by fostering innovative actions related to exploitation and exploration. Second, we urge executives to prioritize higher-level corporate initiatives and interorganizational relationships to strengthen their environmental performance. By focusing on these aspects, organizations can substantially progress in their commitment to environmental sustainability. Third, our research provides crucial insights into organizational networks or communities (such as Merci les Algues) that involve multiple stakeholders in their environmental transition efforts. Cultivating strong interorganizational relationships and strategically aligning partners' specializations in exploration or exploitation improves overall environmental performance significantly. Managers should recognize and harness ambidexterity's potential to drive environmental performance, which can be achieved through corporate-level initiatives and strategic interorganizational partnerships. By doing so, organizations can effectively contribute to environmental sustainability and foster a positive impact on their respective ecosystems.

## 7.2. Limitations & future research paths

The current study has certain limitations that must be acknowledged. First, our findings are specific to SMEs within a French association operating in the agribusiness sector, and our sample comprised primarily regular employees. Recognizing that the surveyed firms are involved in algae-related activities inherently aligned with environmental preservation is vital. This context may have influenced our results, particularly in supporting the relationships between individual ambidexterity and environmental consciousness, company ambidexterity and environmental performance, and interorganizational ambidexterity and interorganizational environmental

performance. Therefore, for broader generalization, it is imperative to replicate our study in less environmentally-focused ecosystems. And since our sample predominantly comprised SMEs, interorganizational ambidexterity may have appeared more necessary than strategic for firms, potentially influencing our results. We encourage further research using a larger dataset to gain deeper insights into ambidexterity across different organizational contexts, industry types, firm sizes, and employees' hierarchical positions. Studying non-managerial employees, as Kauppila and Tempelaar (2016) did, is essential, as they often exhibit different behaviors and act more independently at the organizational level than top management employees (Mom et al., 2009) and frontline managers (Zimmermann et al., 2018). While our study offers valuable insights, its generalizability would be strengthened by exploring diverse industries, firm sizes, and employee roles in a larger sample. By addressing these limitations, future research can build on our findings and provide a more comprehensive understanding of ambidexterity's implications in various organizational settings.

Second, considering our nonsignificant findings regarding the relationships between organizational ambidexterity and organizational performance and between interorganizational ambidexterity and interorganizational economic performance, we emphasize the importance of future studies in thoroughly examining the connection between ambidexterity and economic performance on a broader scale. We suggest adopting profit per employee as the dependent variable, aligning with Guest et al.'s (2003) and Lowell's (2007) approaches. Employing objective measures (rather than subjective ones) would enhance future research's rigor in this domain. By doing so, scholars can further confirm or refute ambidexterity's impact on economic performance and contribute to a more robust understanding of its implications for organizations.

Third, our research is limited by its cross-sectional nature, which may have influenced the lack of significant relationships between individual and organizational constructs. We advocate for

adopting longitudinal research designs in future studies to address this limitation and gain deeper insights. Longitudinal designs would allow researchers to account for the time required for organizational ambidexterity to permeate at the individual level and for the improvements in individual performance to manifest tangible outcomes at the organizational level. By incorporating a time lag between the antecedents and outcomes in multilevel investigations, researchers can better understand the temporal dynamics of ambidexterity and its effects. Additionally, longitudinal studies offer the opportunity to explore alternative causality explanations, as Nielsen & Nielsen (2009) suggested. And this would enrich the ongoing debates surrounding the direction of influence and causality in the context of multilevel ambidexterity. For instance, such studies could shed light on whether interactions among ambidextrous individuals contribute to organizational ambidexterity or if the reverse is true: organizational ambidexterity influences the behaviors of ambidextrous individuals. In conclusion, embracing longitudinal research designs would address the cross-sectional studies' limitations and offer valuable insights into the intricacies of multilevel ambidexterity and the underlying causal relationships between individual and organizational ambidexterity.

# General Conclusion

# 1. Discussion of Main Findings

This dissertation focuses on multilevel ambidexterity by discovering the role of ambidexterity's multilevel interactions, antecedents, and outcomes. Its three chapters complement each other to achieve this thesis's objective. This section explains how the diverse findings provide vital answers to the general and sub-research questions.

First, the results fall into the discussion of multilevel interactions. Ambidexterity characteristics have often been studied in isolation. Yet, levels of analysis are linked, as they are nested by nature. A level of analysis is narrowly linked with the level directly above and below it whenever possible. One exception would be the individual level, which cannot be related to a level below it. The same applies to the interorganizational level and the impossibility of studying the level above it. We argue that the scope of levels of analysis should include the directly linked and closest linked level, except for employing organizational ambidexterity and relating it with the individual level (without considering the team or BU level). Relating the organizational level directly with the individual level could be methodologically relevant for SMEs when arguing that the system's size makes the intermediate level (i.e., the team or BU level) nonrelevant. Based on the multilevel interactions, we argue that the bottom-up and top-down effects are two considerations that necessitate more empirics to reveal the mechanism behind the analysis-level connections. Elaborated theoretical discussions address these two effects on ambidexterity. But little evidence is presented by the empirics.

Concerning multilevel interactions, we have indicated that social interactions at all organizational levels play a pivotal role in managing ambidexterity, as they are at the origin of complementary aspects for developing exploration and exploitation and one of the facilitators of multilevel interactions. Social interactions comprise knowledge transmission, social ties, and exchanges between individual stakeholders. Thanks to these social relation factors, the various institutional systems become permeated between them.

Multilevel interactions are also ways to understand causation between the different nested arrangements more profoundly. This study investigated the relationships between individual and

organizational ambidexterity. The findings are divergent. Study 2 indicates that individual ambidexterity relates positively with organizational ambidexterity, while Study 3 demonstrates no significant relationship between the two variables. Another investigated relationship concerns the organizational and interorganizational levels. Study 3 reveals a positive link between the two macro levels.

Second, our findings indicate that ambidexterity approaches are level-dependent, even if inter-level similarities exist. Figure 4 shows a synthesis of the multilevel study's findings. Applying ambidexterity involves employing behavioral and structural approaches at the organizational and interorganizational levels. However, the contextual approach to ambidexterity is the most appropriate at individual and business-unit levels.

Regarding ambidexterity's antecedents, this thesis provides specific elements to become ambidextrous when studying its multilevel nature. Study 2 sheds light on the pivotal role of an organizational empowerment climate in multilevel relationships. This factor mediates the relationships between connectedness and organizational ambidexterity and individuals' knowledge inflows and their individual ambidexterity. This finding is further complemented by Study 3, which shows individual knowledge exchange facilitates individual ambidexterity. We observe similar findings in the two empirical studies which relate ambidexterity with social connections. Apart from this common characteristic, an additional antecedent is provided by Study 3's results. At the interorganizational level, industry-specific tensions stimulate engagement in interorganizational ambidexterity. And this means that when an industry or a network of companies is subject to substantial pressures and constraints, companies are motivated to collaborate to strike a balance between exploration and exploitation activities through partnerships.

Third, this study explored several outcomes of multilevel ambidexterity. Study 3 presents a novel finding regarding the multilevel relationship between ambidexterity and environmental involvement across the individual, organizational, and interorganizational levels. While three significant ambidexterity outcomes have been presented, it is essential to acknowledge other findings that (though not significant) remain important, as they contradict the theoretical suppositions. Those findings can be explained regarding theory and empirics. At the highest level

of analysis, interorganizational ambidexterity was found to relate positively with environmental performance but did not significantly impact economic performance. And this can be attributed to the economic independence of firms, regardless of their activities in partnerships. It also aligns with the motivation behind creating such partnerships in our research setting. At the organizational level, organizational ambidexterity was beneficial for environmental performance but did not relate significantly with companies' economic and social performance. Finally, at the individual level, individual ambidexterity is positively related with environmental consciousness. Consequently, this study indicates that examining ambidexterity across three levels of analysis reveals environmental involvement as a positive outcome arising from the ability to manage tensions between exploration and exploitation.

Table 26 summarizes the main findings and respective contributions. It also provides crucial answers to this thesis's primary research question. Theoretical contributions to the main fields of literature are presented as follows: strategic and innovation management, multilevel ambidexterity, and microfoundations. Detailed managerial contributions are provided for practitioners, and some research perspectives are proposed for future work.

Table 26 : Main Findings and Contributions

| | Main Findings | Contributions |
|---|---|---|
| Multilevel interactions | Top-down and bottom-up effects are critical considerations across levels *(Study 1)*. | Providing a clear overview of ambidexterity's multilevel nature |
| | Social relations and interactions play a pivotal role across organizational arrangements (*Study 1*). | Building on multilevel studies by suggesting multilevel antecedents |
| | The IA of regular employees contributes to OA *(Study 2)*. | Investigating the microfoundation for developing ambidexterity |
| | Non-significant interactions between OA and IA but significant interactions between OA and interorganizational ambidexterity *(Study 3)* | |
| Multilevel antecedents | Antecedents and ambidexterity approaches are level- dependent *(Study 1)*. | Revealing the importance of contextual antecedents for dual-level benefits |
| | An empowerment climate is a lever of IA and OA *(Study 2)*. | Expanding on multilevel studies by suggesting a common antecedent |
| | Organizational connectedness enables OA *(Study 2)*. | Extending the literature concerning how to become ambidextrous |
| | Industry-specific tensions relate positively with interorganizational ambidexterity *(Study 3)*. | Complementing the interorganizational knowledge regarding how to become ambidextrous |
| | Knowledge sharing enables IA *(Study 3)*. | Emphasizing ambidexterity's behavioral antecedents |
| Multilevel outcomes | Interorganizational ambidexterity favors environmental performance over economic performance *(Study 3)*. | Highlighting interorganizational ambidexterity's benefits |
| | OA improves environmental performance but not economic and social performance *(Study 3)*. | Contributing to organizational learning theory for more virtuous outcomes |
| | IA relates positively with environmental consciousness *(Study 3)*. | Extending the multilevel literature to benefit from individual ambidexterity |

# 2. Contributions

## 2.1. Theoretical Implications

This section reviews our theoretical contributions concerning the literature on strategic and innovation management, multilevel ambidexterity, and microfoundations.

### 2.1.1. Contributions to the Strategy and Innovation Management Literature

Ambidexterity is a vital research topic in strategy and innovation management literature. Our research contributes to the understanding of ambidexterity within various organizational contexts. Chapter 1 starts by recognizing that the original concept of ambidexterity formulated by Duncan (1976) and March (1991) has evolved, leading to the study of diverse tensions and the various quests for paradoxical equilibrium. Our empirical findings show that organizational ambidexterity does not always lead to economic performance. This almost-consensual relationship is challenged, introducing nuance into the statements made by scholars such as Lubatkin et al. (2006), He & Wong (2004), Vrontis et al. (2017), and Yu et al. (2020).

Ambidexterity contributes to virtuous outcomes. This contribution bridges the gap between ambidexterity and triple-bottom-line performance. Our analysis of overall organizational performance addresses George et al.'s (2016) call since we support that ambidexterity can cause positive environmental outcomes.

By complementing the existing interorganizational knowledge regarding achieving ambidexterity, Chapter 3 expands upon Zimmermann et al.'s (2015) research on the advantages of interorganizational ambidexterity and contributes to the increasing number of empirical studies considering the interorganizational level in multilevel ambidexterity.

### 2.1.2. Contributions to Multilevel Ambidexterity

This research expands on the ambidexterity literature by contributing to the multilevel perspective on becoming ambidextrous by revealing an empowerment climate's critical role. For instance, Chapter 2 suggests the main multilevel antecedents of ambidexterity by measuring organizational and individual ambidexterity. Our findings extend previous studies (García-Granero et al., 2018; Molina-Azorín et al., 2020) by examining the micro and macro variables and exploring factors contributing to ambidexterity.

Various levels of analysis may have a shared antecedent that becomes apparent when different levels of analysis are examined within the same study. Unlike Maruping & Magni's (2012) findings, Chapter 2 reveals that an empowerment climate does not reduce an individual's intention to explore new technologies. An empowerment climate fosters individual exploration and exploitation and collective motivation, engagement, and creativity — all of which stimulate organizational activities related to ambidexterity.

### 2.1.3. Contribution to the microfoundation of ambidexterity and its approaches

Drawing on Felin and Foss's (2005) concept of microfoundation and expanding upon Gibson and Birkinshaw's (2004) study, this research contributes to the microfoundation of ambidexterity by complementing past results regarding individual ambidexterity. We argue that ambidexterity can be explained by lower-level factors. Our study acknowledges that studies on individual ambidexterity have focused mainly on top hierarchical individuals, such as executives and top management. We contribute to the microfoundational approach by arguing, in Chapter 2, that operational managers can be active participants in organizational ambidexterity (Zimmermann et al., 2018). Nonetheless, Chapter 3 contradicts and adds nuance to this finding by demonstrating that the ambidextrous behavior of all employees, regardless of their hierarchical positions, is not associated with organizational ambidexterity, thus providing a contrasting perspective to Lubatkin et al.'s (2006) conclusion.

Our microfoundational approach supports the relevance of contextual and behavioral ambidexterity over other methods, such as structural or sequential. We enrich the knowledge about individual ambidexterity by measuring the relationship between knowledge sharing and environmental consciousness. When analyzing this relationship, we deal primarily with behavioral measurement. By contributing to the existing studies of Rogan & Mors (2014) and Tempelaar and Rosenkranz (2019), we advance that contextual or behavioral approaches are those that could be associated with lower levels of analysis because of their adaptability to unexpected events and the comparative ease with which they are managed by small entities (such as individuals) with limited time and capacity to balance both activities.

### 2.1.4. Extending Beyond Multilevel Interactions

By proposing a comprehensive framework, Chapter 1 describes the multilevel perspective**,** drawing on different levels of analysis and ambidexterity approaches often used to conceptualize the antecedents and context of ambidexterity. Adopting this perspective complements existing ambidexterity literature and multilevel approaches by exploring ambidexterity as a nested phenomenon. This contribution builds upon Hitt et al.'s (2007) organizational paradigm of ambidexterity, highlighting various nested arrangements and cross-level interactions.

This thesis holds a significant theoretical implication that comprises opening up new avenues of research. Beyond offering valuable insights into ambidexterity, it outlines various approaches in all chapters, particularly in Chapter 1's research agenda. It identifies crucial areas, such as theoretical foundations, construct operationalization, analysis at specific levels, interactions between different levels of analysis, and empirical contexts, that warrant deeper investigation. This work differentiates itself from other ambidexterity studies, which primarily focus on single-level analysis by considering multilevel studies a priority.

Finally, this research goes beyond the literature on multilevel ambidexterity by investigating the links between three organizational levels under the double-bathtub framework. Chapter 3's conceptual model contributes to the microfoundational approach to inter-level relationships based

on applying Felin et al.'s (2015) reasoning to ambidexterity and performance. By employing a double-bathtub model to conceptualize the multilevel relationships, we highlight the interactions between individual and organizational ambidexterity and between organizational and interorganizational ambidexterity. Therefore, this approach adds insights into the top-down and bottom-up effects on performance covered by Henriques & Richardson's (2004) research. Thus, the study complements previous work by adding a more inclusive picture of nested arrangements in and between companies. And this contributes to multilevel analysis by offering a new visualization of ambidexterity's occurrence across organizational levels.

## 2.2. Managerial Implications

*"This mental balancing act can be one of the toughest of all managerial challenges—it requires executives to explore new opportunities even as they work diligently to exploit existing capabilities—and it's no surprise that few companies do it well"* (O'Reilly & Tushman, 2004, p. 2).

Real-world organizational ambidexterity presents a higher level of complexity than the simplified ideal types found in academic literature. This complexity and variability emerge from the extensive organizational context of development and change, which operates over space and time, implying multiple underlying mechanisms. Various factors influence organizational development: external and internal, micro and macro, and top-down and bottom-up sources, all simultaneously dynamically affecting organizational ambidextrous endeavors. Moreover, implementing ambidexterity is a time-consuming process during which various underlying mechanisms may interact, resulting in a multilayered progression. To rely only on one level of analysis to explain ambidexterity risks oversimplification and undue emphasis on one aspect, overlooking other vital factors. And this is why multilevel analysis may be beneficial for clarifying managerial implications. Considering our findings, we argue that ambidextrous organizations may activate different factors from the organizational level and their partnerships and employees.

This dissertation presents valuable practical insights for various stakeholders, including organizations, CEOs, managers, and employees. While the managerial implications primarily apply to SMEs in agribusiness, they are also developed to be generalized to businesses across various industries. The presented practical implications can help companies navigate exploration and exploitation effectively. These implications are derived from the robust results presented earlier, which were interpreted thanks to the field experience accumulated during data collection. Adding real-world insights to empirical results makes the recommendations well-grounded and relevant for businesses seeking to enhance their ambidexterity and overall performance.

Our results offer managerial insights for companies to develop a specific form of ambidextrous capability. When working toward ambidexterity, we argue that individual actions and initiatives contribute to organizational orientations and objectives. And this means that individual employees' actions are critical enablers in fostering various organizational activities related to exploration and exploitation, such as optimizing production processes, introducing new selling points or products, and increasingly diversifying activities. And organizations must create a supportive environment for innovation and experimentation while maintaining effective processes or reviewing them to achieve ambidexterity. One crucial aspect is cultivating an empowerment climate within the organizational culture, as it encourages employees (and the company as a whole) to engage in potentially conflicting activities that ultimately benefit the company. An empowerment climate drives ambidexterity, allowing companies to balance exploration and exploitation to remain competitive and adaptive in dynamic markets.

Moreover, this work provides managerial results (in reference to Chapter 3) presented to CEO members of the association during the general assembly of the Merci les Algues association on June 21st, 2023. As presented previously, the data collection protocol has partly been executed through visiting companies. Of all companies who participated, 24 were visited to meet CEOs, obtain their agreement, and meet several employees that could not respond to the survey by email. Those meetings also provided insights contributing to a better interpretation of the findings.

One key point underscored here is the importance of incorporating ambidexterity to enhance environmental performance. Companies can elevate their environmental engagement by

encouraging innovative actions encompassing exploitation and exploration. Related to this, our findings indicate how ambidexterity can be achieved and the critical points that require the attention of CEOs and managers. Executives must prioritize higher-level corporate ambidexterity-related initiatives and interorganizational relationships to strengthen environmental performance. Such organizational networks or communities can benefit the member companies and increase the mutual environmental engagement resulting from interorganizational relationships. In other words, by cultivating interorganizational relationships and strategically aligning partners' specializations in exploration or exploration, overall and mutual environmental performance can be improved significantly.

## 3. Limitations and paths for further studies

This dissertation's research has various limitations that necessitate further investigation. While the preceding chapters have explained the specific limitations of individual studies, the present focus is on identifying overarching constraints and corresponding suggestions for future research.

Ambidexterity is a mature field of research that has led to thousands of publications. Although ambidexterity holds real interest for scholars and practitioners, reflecting on its possible limitations is crucial. Balancing exploration and exploitation implies viewing phenomena through duality glasses and a certain amount of opposition (or at least distance between the two ends of the spectrum). The conceptualization of two activities (such as exploitation and exploration) pushes the reflection toward categorizing and finding a fit under those two orientations. This research elaborates on the theoretical assumptions that ambidexterity is beneficial for organizations. The optimistic view of ambidexterity has largely been supported by the literature. But we argue that it would be relevant to understand the limit and boundaries between the two categories. We may also ponder this related question, which touches the research limit: Is relentlessly seeking an optimized balance between exploration and exploitation as beneficial as exhibiting ambidextrous behavior without necessarily being consciously aware of it? This thought is motivated by the fact that research studies on ambidexterity often rely on perceptions we would need to overcome to develop more grounded frameworks.

More research is needed regarding ambidexterity's potential drawbacks and how they influence an organization across its different levels. At the individual level, we can readily imagine the possible undesirable effects of ambidexterity in the workplace, such as stress (or anxiety) and distraction. At organizational or interorganizational levels, companies may face other negative effects related to time constraints, increased costs, and potential knowledge spillovers. Understanding and being aware of these drawbacks would be an essential building block to effectively implementing ambidexterity across organizational levels.

Continuing with the conceptualization of ambidexterity and its application to organizations, we recognize the limitation of the current form of ambidexterity, which revolves around only two

types of activities. Our research has led us to realize that exploration and exploitation can be quite restrictive, as it fails to account for activities of reinforcing old principles or transmitting savoir-faire and ensuring it lasts. This reinforcing activity can also cause tension complementing exploration and exploitation. Thus, we suggest developing a more inclusive form of ambidexterity (one that considers the most formidable strategic and innovation challenges companies face). This new component of ambidexterity would imply renaming it multi-dexterity, extending it beyond the restrictive duality of exploration and exploitation.

A limitation for companies and a topic for further studies would be to study the various obstacles exerted on companies that retain them for being more responsible. Few companies and collective movements are fighting against the lobbying of big parties. When considering the environmental transition, we see that it requires much more effort to go backward, i.e., by erasing the past harmful habits, than the facility of big industries to impose phytosanitary products on a substantial volume of the population. This opinion represents a gap in management knowledge regarding how companies can go backward with trusted and efficient solutions on a large scale to preserve the planet. Understanding more profoundly how the petrochemical industry took over businesses may clarify strategic plans for taking a planet-friendly direction.

Another limitation that came up during the data collection concerned confidentiality and the reluctance to share information. Confidentiality poses a significant challenge to research endeavors in France. Society places substantial importance on concealing financial data and numbers, creating barriers for researchers seeking access to organizational performance information as firsthand data. This reluctance to share data might be partially due to the lesser-known nature of research in management science or its relatively less favorable public perception (compared to hard sciences). Although this contextual characteristic was overcome by respecting ethical research guidelines, it impacted the sample size of our studies. Thus, we encourage further research on this topic in another country.

In addition to the country of research, the field of application was agribusiness, which may have specific characteristics compared to other industries. As a result, it is critical for future research to challenge or support our findings in different contexts. In particular, it would be interesting to

further investigate the link between ambidexterity and environmental engagement in other research settings or ecosystems that are, a priori, less concerned about the environment. Multilevel ambidexterity should be studied in an industry other than agriculture.

In addition to the path of further research involving multilevel studies, we acknowledge that CEOs play a significant role in encouraging individual ambidexterity, integrating ambidexterity into the organizational strategy, or developing ambidexterity through interorganizational relationships. Considering the literature, some related concepts would also need to be empirically conformed to ambidexterity. Moreover, longitudinal studies are necessary to establish causal relationships and grasp the dynamics behind the ambidextrous orientation.

In conclusion, the multilevel perspective on ambidexterity sheds light on new solutions for achieving this challenging mental balancing act for managers (O'Reilly & Tushman, 2004), bringing research closer to the complex reality of organizations.

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# Appendices

Appendix 1 : Methodological Approaches of the 59 Selected Multilevel Studies

| Study Type | Methodology | | ID | Authors | Year |
|---|---|---|---|---|---|
| Empirical | Quantitative | Descriptive and bivariate correlation | 1 | Ambos et al. | 2008 |
| | | Longitudinal–Negative binomial regression | 8 | Russo & Vurro | 2010 |
| | | Negative binomial regression | 9 | Karamanos | 2012 |
| | | Descriptive, multiple regression analysis and HLM | 24 | Y. C. Chang et al. | 2016 |
| | | Hierarchical regression | 46 | Kiss et al. | 2020 |
| | | PLS-SEM | 52 | Zhang et al. | 2020 |
| | | Descriptive analysis, correlation, SEM | 57 | Silalahi et al. | 2021 |
| | | HLM | 16 | Y. Y. Chang | 2015 |
| | | | 23 | Y. Y. Chang | 2016 |
| | | | 25 | Jansen et al. | 2016 |
| | | | 30 | Kobarg et al. | 2017 |
| | | | 36 | Y. Y. Chang et al. | 2019 |
| | | | 51 | Yu et al. | 2020 |
| | | | 59 | R. Wang & Gibbons | 2021 |
| | | Descriptive analysis, correlation, Poisson regression model | 39 | Li & Wang | 2019 |
| | | Survey analysis | 20 | Glaser et al. | 2015 |
| | | | 33 | Hirst et al. | 2018 |
| | | LMS | 35 | Barrutia & Echebarria | 2019 |
| | | SEM | 26 | Ajayi et al. | 2017 |
| | | | 50 | Venugopal et al. | 2020 |
| | | MPlus | 40 | Mom et al. | 2019 |
| | | | 55 | Katou et al. | 2021 |
| | | Multilevel regression analysis | 31 | J. Y. Lee et al. | 2017 |
| | | OLS Regression | 45 | Hughes et al. | 2020 |
| | | | 47 | J. Y. Lee et al. | 2020 |
| | | Meta-analysis | 11 | Junni et al. | 2013 |

| Study Type | Methodology | | ID | Authors | Year |
|---|---|---|---|---|---|
| Empirical | Mixed method | Interviews and surveys | 13 | Yu et al. | 2013 |
| | | | 42 | Swart et al. | 2019 |
| | Qualitative | Project workshops observations | 44 | Bidmon & Boe-Lillegraven | 2020 |
| | | Single and multiple case studies | 6 | Andriopoulos & Lewis | 2010 |
| | | | 10 | Nilsson | 2012 |
| | | | 14 | Turner et al. | 2014 |
| | | | 15 | Burgess et al. | 2015 |
| | | | 17 | Chen & Kannan-Narasimhan | 2015 |
| | | | 18 | Coradi et al. | 2015 |
| | | | 19 | Garcias et al. | 2015 |
| | | | 22 | Zimmermann et al. | 2015 |
| | | | 34 | Snehvrat & Dutta | 2018 |
| | | | 37 | Kassotaki et al. | 2019 |
| | | | 41 | Stokes et al. | 2019 |
| | | | 54 | Evers & Andersson | 2021 |
| | | | 58 | P. Smith & Beretta | 2021 |
| | | Longitudinal case study | 3 | Andriopoulos & Lewis | 2009 |
| | | | 5 | F. Wang & Jiang | 2009 |
| | | | 43 | Tillement et al. | 2019 |
| | | | 56 | Pereira et al. | 2021 |
| | | Ethnographic study | 21 | Stokes et al. | 2015 |
| Theoretical | Conceptual | | 4 | Simsek | 2009 |
| | | | 7 | Lavie et al. | 2010 |
| | | | 12 | Turner et al. | 2013 |
| | | | 27 | Asif | 2017 |
| | | | 28 | Fernandez-Perez de la Lastra et al. | 2017a |
| | | | 29 | Fernandez-Perez de la Lastra et al. | 2017b |
| | | | 32 | Rapp et al. | 2017 |
| | Review | | 2 | Raisch & Birkinshaw | 2008a |
| | | | 48 | Mueller et al. | 2020 |
| | | | 49 | Pertusa-Ortega et al. | 2020 |
| | | | 53 | Christofi et al. | 2021 |
| | Theoretical framework development | | 38 | Kim | 2019 |

Appendix 2 : Research Context of the Selected Empirical Studies

| Industry type | Organizational type/country | Methodology | Authors | Year |
|---|---|---|---|---|
| **Public sector** | Research projects in the UK | Quantitative study on 207 research-council–funded projects | Ambos et al. | 2008 |
| | Governmental and military organizations in the UK | Qualitative paper: two cases study and interviews of a quasi-governmental organization and a military organization | Stokes et al. | 2019 |
| | Aerospace and defense governmental organization | Case study based on 30 interviews in six business units in four European countries | Kassotaki et al. | 2019 |
| | Public organizations in the UK | Ethnographic-style study of a quasi-public training and development organization | Stokes et al. | 2015 |
| | Universities in Taiwan | Quantitative study on 634 faculty members in 99 departments and 6 universities | Y. C. Chang et al. | 2016 |
| | Higher education in Germany | Survey and HLM analysis of 594 German doctoral and postdoctoral candidates | Kobarg et al. | 2017 |
| | Municipalities in Spain | Survey of 656 Spanish Municipal Representatives | Barrutia & Echebarria | 2019 |
| | Hospitals in the UK | Case study on hospitals through 91 interviews | Burgess et al. | 2015 |
| | Hospital | Quantitative HLM study on 770 nurses in 48 units of a large hospital | Yu et al. | 2020 |
| **IT** | Telecommunication delivery in the UK | Case study of telecommunications delivery for the London Olympic Games | Turner et al. | 2014 |
| | Technology firms in Taiwan | Top manager teams, unit managers, and employees across 200 units in 92 Taiwanese technology firms | Y. Y. Chang et al. | 2019 |

| | | | | |
|---|---|---|---|---|
| | Information Technology in the United States | Case study on 9 companies in the Silicon Valley | Chen & Kannan-Narasimhan | 2015 |
| | Information Technology firms in China | Quantitative study on 278 employees working in three IT companies | Zhang et al. | 2020 |
| | Computer and electronics firms in Taiwan | Data analysis from 346 employees and 184 managers of 33 engineering firms | Y. Y. Chang | 2016 |
| | Technology-intensive companies in India | Survey of 220 CEOs of private and public SMEs | Kiss et al. | 2020 |
| **Service** | Digital service and water pump manufactured provided in Europe | Single case study of a manufacturing firm of 20,000 employees | P. Smith & Beretta | 2021 |
| | Service firms in the UK | 35 interviews and a survey of 212 employees in a Professional Service Firm | Swart et al. | 2019 |
| | Professional services and maritime industries | Observational study of facilitated strategy workshops | Bidmon & Boe-Lillegraven | 2020 |
| | Financial service firms in Taiwan | Data analysis from 467 operational managers and 104 senior managers within 52 firms | Mom et al. | 2019 |
| | Transport and logistics services company in the Netherlands | Data analysis from 397 middle managers and 72 top managers | Glaser et al. | 2015 |
| **Biotechnology** | MedTech in Ireland and Sweden | 4 case studies on high-tech international new ventures | Evers & Andersson | 2021 |
| | A pharmaceutical group in Switzerland | Case study of Novartis, interviews, observation | Coradi et al. | 2015 |
| | High-Tech and Pharmaceutical company in Europe | Data analysis of 87 teams within 37 high-tech and pharmaceutical firms | Jansen et al. | 2016 |

| | | | | |
|---|---|---|---|---|
| | MedTech company in Sweden | Case study on 200 employees from one company between 2009 to mid-2011 | Nilsson | 2012 |
| | Biotechnological alliances | Patents of 455 firms in 1986-1999 and 2,933 technological alliances | Karamanos | 2012 |
| | Biotechnological alliances in the United States | Study of 1,614 alliances formed by 581 US biotechnology firms | Li & Wang | 2019 |
| | Biotechnological firm in India | Longitudinal single case study of an Indian Biotech firm (biopharma) | Pereira et al. | 2021 |
| | Fuel cell industry | A quantitative longitudinal study on 153 companies over 1999-2006 | Russo & Vurro | 2010 |
| **Banking** | Banks | HLM on more than 2,306 frontline employees in 267 branches + interviews | Yu et al. | 2013 |
| | Banks in Taiwan | Data analysis from 2,887 employees and 536 managers of 58 banks | Y. Y. Chang | 2015 |
| **Product development** | Product design companies in the United States | Case study on 5 companies (86 interviews and archival data and observations) | Andriopoulos & Lewis | 2009 |
| | Haier company in China | Longitudinal case study and interviews of NPD teams | F. Wang & Jiang | 2009 |
| | Product design companies in the United States | Case study on 7 companies (114 interviews and archival data and observations) | Andriopoulos & Lewis | 2010 |
| **Customer-facing industry** | Customer-facing industry in Indonesia | Quantitative study on 102 cross-functional teams from 20 firms in the customer-facing industry | Silalahi et al. | 2021 |
| | Shops in Nigeria | A quantitative study on 72 Nigerian SMEs with 398 employees | Ajayi et al. | 2017 |
| **Automobile** | Automobile company in India | Case study of Tata Motors, interviews | Snehvrat & Dutta | 2018 |
| | Automobile manufacturer in Germany | Case study of 143 individuals working for four alliances | Zimmermann et al. | 2015 |

| | | | | |
|---|---|---|---|---|
| **Industrial** | Industrial infrastructure in France | Case study of an industrial infrastructure unit with 49 interviews | Garcias et al. | 2015 |
| **Nuclear** | Nuclear reactor site | Single case study on a project, 23 interviews from 2015 to 2019 | Tillement et al. | 2019 |
| **Multiple industries** | Firms in Australia, Taiwan, and China | Data analysis of 317 engineers from construction, industrial design, manufacturing, IT, and electronics | Hirst et al. | 2018 |
| | Academic research articles | Meta-analysis on major academic databases | Junni et al. | 2013 |
| | Firms from multiple industries in the UK | A quantitative survey of 143 senior-level managers in an M&A context | Hughes et al. | 2020 |
| | Companies in South Korea | A quantitative survey of 758 employees in 50 companies | Lee et al. | 2017 |
| | Companies from 24 regions in China | A quantitative survey of 4037 teams operating in 1,468 MNEs | Lee et al. | 2020 |
| | SMEs in the IT, electronics, and biotechnology industries in India | A quantitative survey of 473 employees of 83 companies | Venugopal et al. | 2020 |
| | Manufacturing, trade, and service companies in Greece | A quantitative survey of 657 employees of 99 companies | Katou et al. | 2021 |
| | Various industries | Survey and archival data on 592 managers participating in an MBA | R. Wang & Gibbons | 2021 |

Appendix 3 : Analysis of the Multilevel Empirical Studies

| Levels | Interorganizational | Organizational | BU | Team/Group | Individual |
|---|---|---|---|---|---|
| Interorganizational | | Russo & Vurro 2010<br>Karamanos 2012<br>Li & Wang 2019<br>Barrutia & Echebarria 2019 | No article | No article | Pereira et al. 2021 |
| Organizational | | | Chen & Kannan-Narasimhan 2015<br>Y. Y. Chang 2015<br>Y. Y. Chang 2016 | Lee et al. 2020<br>Jansen et al. 2016 | Ambos et al. 2008<br>Nilsson 2012<br>Garcias et al. 2015<br>Kobarg et al. 2017<br>Lee et al. 2017<br>Ajayi et al. 2017<br>Mom et al. 2019<br>Swart et al. 2019<br>Stokes et al. 2019<br>Y. Y. Chang et al. 2019<br>Venugopal et al. 2020<br>Kiss et al. 2020<br>Bidmon & Boe-Lillegraven 2020<br>Zhang et al. 2020<br>Katou et al. 2021<br>P. Smith & Beretta 2021<br>Evers & Andersson 2021<br>R. Wang & Gibbons 2021 |
| BU | | | | No article | Yu et al. 2013<br>Glaser et al. 2015<br>Kassotaki et al. 2019<br>Yu et al. 2020<br>Zimmermann et al. 2015 |
| Team/Group | | | | | Coradi et al. 2015<br>Y. C. Chang et al. 2016<br>Hirst et al. 2018<br>Tillement et al. 2019<br>Silalahi et al. 2021 |
| Organizational & Individual | Burgess et al. 2015<br>Hughes et al. 2020 | | No article | Andriopoulos & Lewis 2009<br>Wang & Jiang 2009<br>Andriopoulos & Lewis 2010<br>Turner et al. 2013<br>Turner et al. 2014<br>Stokes et al. 2015 | |
| BU & Individual | No article | Snehvrat & Dutta 2018 | | | |

**Morgane LOQUEN**

# Ambidexterity across organizational levels – a study of its multilevel antecedents and outcomes


## Résumé

Le développement d'une stratégie ambidextre est un moyen d'acquérir un avantage concurrentiel. Comprendre le rôle des antécédents et des conséquences multiniveaux nécessite des études microfondationnelles supplémentaires. Cette thèse s'appuie sur une enquête d'experts, une revue de littérature systématique et deux études empiriques quantitatives - aux niveaux individuel, organisationnel et interorganisationnel - auprès de PME de l'agroalimentaire. Premièrement, un modèle multiniveau conceptualise les antécédents de l'ambidextrie. Deuxièmement, le climat d'autonomisation est crucial aux flux de connaissances individuels, à la connectivité et à l'ambidextrie individuelle/organisationnelle. Troisièmement, nos données ne soutiennent pas la relation entre l'ambidextrie et la performance économique, mais révèlent la relation avec la performance environnementale organisationnelle et inter organisationnelle. Cette thèse contribue à renforcer l'ancrage théorique de l'ambidextrie multiniveaux, à approfondir la compréhension des phénomènes imbriqués et à proposer une triple performance pour les entreprises de l'agroalimentaire.


**Mots-clés :** ambidextrie, multiniveau, microfondation, agroalimentaire, climat d'autonomisation, triple performance


## Abstract

Developing an ambidextrous strategy is widely recognized as a means to gain a competitive advantage. However, understanding the role played by multilevel antecedents and outcomes from a microfoundational perspective requires further studies. This thesis presents an expert survey, a systematic literature review, and two quantitative empirical studies (at the individual, organizational and interorganizational levels) from SMEs in agribusiness. First, a multilevel framework conceptualizes ambidexterity's antecedents. Second, an empowerment climate is crucial at the intersection of individuals' knowledge inflows, connectedness, and individual/ organizational ambidexterity. Third, our data does not reinforce the relationship between ambidexterity and economic performance but supports the relationship with environmental performance at organizational and interorganizational levels. This thesis contributes to strengthening the theoretical anchoring of multilevel ambidexterity to unpack nested phenomena further and propose a triple-bottom-line perspective for companies in agribusiness.


**Keywords:** ambidexterity, multilevel, microfoundation, agribusiness, empowerment climate, triple bottom line