What We Talk About When We Talk About Agency: A Systematic Review of Agency in Video Games

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Agency, which refers to the capacity for players to make meaningful choices and perceive their consequences, is a critical element in game studies. Despite its importance, there is a lack of consensus regarding its definition and measurement within the field. We conducted a systematic review of 79 peer-reviewed full-text articles from SCOPUS that examine agency in video games. The results reveal substantial diversity in how agency is defined across gaming contexts, which constrains research consistency and cumulative knowledge building. In addition, although questionnaires are widely used, few validated scales have been developed specifically for video games, limiting comparability across studies. Finally, existing research tends to prioritise agency expressed through in game structures such as interaction and narrative, rather than agency as a subjective experience of players. This review contributes to clarifying the concept of agency and its measurement, and supports a broader focus on player-centred outcomes to enable a more balanced understanding of agency in video games.

CCS Concepts: • **Applied computing** → **Computer games**; • **General and reference** → *Surveys and overviews*; • **Human-centered computing** → *HCI theory, concepts and models*.

Additional Key Words and Phrases: Systematic review, Agency, Player Experience, Video games, HCI

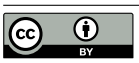
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1 Introduction

As a medium, one of the core attractions of video games is to offer players a unique experience: the experience of agency. Different from traditional passive media like film or literature, video games not only invite audiences to witness a series of events, but also involve them in interacting as causes within the evens [35]. When a player presses a button, the digital world responds; when a player makes a choice, the narrative path changes. This cycle of action, feedback, and subsequent action forms the foundation of the gaming experience. The resulting sense of control and causation over the virtual world is what we commonly refer to as 'agency'.

However, this experience is to some extent also a carefully crafted illusion. In his work, Galloway [34] describes video games as allegories of control. He points out that whilst games appear to offer players boundless freedom, this freedom is in fact strictly constrained within the inflexible framework of algorithmic logic. A frequently cited case within the gaming community is the highly regarded *Bioshock* [43], whose famous plot twist exposes the fundamental problem with the

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illusion of player agency. The phrase 'Would you kindly…?' delivers a deep shock to the player's self-positioning. Throughout most of the gameplay, players believe they exercise true agency: they determine subsequent actions through exploration, combat, and interaction with the game system. Yet the narrative climax reveals this entire experience to be nothing more than a conditioned response triggered by that single phrase. This moment not only breaks the narrative but also shows the core paradox of the video game: the perceived 'freedom of action' experienced by players is often just a performance within the strict constraints of code.

This example demonstrates one of the most constant debates in game studies over the past two decades: what exactly constitutes agency? Is it the player's capacity to act within a system? The subjective perception of controlling the game? Or the transfer of human authority to the digital systems? Scholars have attempted to define, measure, and construct agency, even questioning its very existence. Despite this sustained attention, agency remains conceptually unstable and fragmented at the theoretical level. For those new to the field, the most immediate impression is not the accumulation of knowledge, but rather a confusion of definitions.

Based on our preliminary review, the literature on agency presents a significant degree of fragmentation. Researchers from different disciplines engage in the discussion with their own distinct frameworks, leading to disagreements over assumptions and terminology. From a human-computer interaction perspective, agency is often grounded in functional interaction and usability, emphasising the system's capacity to support player actions through feedback loops [42, 100]. Narratology, on the other hand, ties agency closely to the player's role as a co-author of the story, where their choices exert expressive influence over plot progression [52, 92]. Broader humanistic and philosophical perspectives treat agency as an aesthetic and political attribute of the medium itself, with interpretations drawing upon queer theory, posthumanism, and sociological lenses [33, 63, 81]. Taken together, these perspectives have not developed into a multi-layered theoretical framework. Instead, these studies have turned agency into a conceptual Tower of Babel: though various scholars have attempted to construct it, the 'linguistic' fragmentation has caused all the bricks to scatter around rather than be assembled layer upon layer.

Considering the aforementioned conceptual ambiguity and fragmented discussion, it is necessary to conduct a systematic literature review to synthesise and clarify understandings of agency in video games. Despite the term's significant role in game design and research, no comprehensive review has yet examined the multiple definitions, measurements, and debates surrounding agency within gameplay. This review aims to address this gap by examining the academic literature on agency in video games and synthesising insights from multidisciplinary perspectives. Through this approach, we seek to refine the terminological framework, analyse conceptual agreements and disagreements, and map out new pathways for future research.

2 Background

The concept of agency first came from philosophy, where it was described as the human capacity to act with intention [102]. Early discussions centred on free will, moral responsibility, and human autonomy [4]. When the term entered social science, it was narrowed so that it could fit social settings, with attention to power, class, and social structure [37]. This shift placed agency within everyday life and social relations, and highlighted how action is shaped by both personal intention and external limits.

In the early twenty first century, agency was adopted in video game studies, but the meaning was narrowed again to suit interactive systems. Compared with philosophy and sociology, game research focused more on how players act within the algorithm-based environments. Early studies often described agency in two ways. One viewed agency as choice, stressing the number or range of actions a game offers. The other viewed agency as freedom, which noted the sense of being able

to act without feeling blocked by the system [91]. Later work expanded these views and offered several interpretations of agency in this complex player system interactions. Some researchers described agency as a form of communication between the player and the game system, where each action reflects a dialogue shaped by rules, feedback, and player intention [52, 92, 99]. Others argued for non-human agency, pointing to the role of systems, non-player characters, and materials that shape outcomes beyond direct player control [26, 42, 71]. At the same time, work on perceived agency looked at how players judge their own interpretations of the game events and their feelings during play [8, 27, 51]. These studies gave agency many rich meanings but also made the concept less clear, as the field now uses several overlapping definitions.

Recent work since 2018 has highlighted how player agency shapes the game experience. For instance, studies find that when players perceive greater agency, they report higher engagement and a clearer understanding of game system behaviour [24]. Work on the emotional aspects of play suggests that agency also influences how players link their choices to outcomes: players feel more satisfaction when results clearly stem from their own actions, but experience stronger regret when they can see the consequences of the choices they did not take [51]. Other studies report that agency contributes to a stronger sense of meaning and identification during narrative-focused play [21]. These findings suggest that agency is a crucial factor in shaping how players engage with games on multiple levels. It influences not only emotional responses and motivation, but also how players interpret outcomes, connect with characters, and understand the entire game system. A clearer and more consistent framing of agency can help explain how different forms of interaction shape player experiences, and how game systems can either support or undermine players' perceptions of meaning and control.

At the same time, specific design elements can alter players' sense of agency. For example, adaptive game systems, such as dynamic difficulty adjustments, can change how players perceive their agency [32]. Likewise, interface factors like low input latency and timely feedback strengthen the immediate feeling of control, directly affecting moment-to-moment agency [22, 46, 88]. Narrative features play another role; design such as branching storylines, meaningful character choices, and reactive dialogue all reinforce the sense that player actions matter [15]. Together, these examples illustrate that agency is shaped across multiple layers of design, from low-level controls to high-level causal attribution. The clarification of agency would help in describing how players act, how systems respond, and how both sides shape the final experience.

3 Methodology

We conducted a systematic literature review of academic research addressing the concept of agency in video games. The review process adhered to the PRISMA 2020 guidelines [70] for the identification, screening, and inclusion of relevant studies. Most of the data collection, screening and analysis was carried out by the first author, with the supervising authors providing guidance and advice and participating in reliability checks during the codebook revision process. All eligible papers were analysed to address the following research questions:

RQ1: How is agency in video games defined? (e.g., conceptual origins, definitional variations, and related or ambiguous constructs)
RQ2: How is agency in video games operationalised and measured in empirical research?
RQ3: In what ways has existing research demonstrated relationships between agency and other game-related concepts?
RQ3a: How do specific game elements or design features influence players' sense of agency?
RQ3b: How does agency, in turn, shape or affect player experience?

3.1 Data Collection

3.1.1 Identification. We conducted the database search in November 2023 using SCOPUS. SCOPUS was selected because it provides broad coverage of peer-reviewed literature across human computer interaction (HCI), game studies, computer science, social sciences, and arts and humanities. This was important as research on agency in video games is distributed across several fields rather than located within a single discipline. SCOPUS also supported consistent record export, which helped maintain a transparent screening process.

The objective of this review was to examine the current state of research on *Agency in video games*, clarify conceptual definitions, and identify how agency has been operationalised and measured in empirical studies.

Prior to defining the final search strategy, we undertook exploratory searches to familiarise ourselves with terminology and publication patterns in this area. These scoping searches indicated that agency-related research in video games spans approximately two decades. Accordingly, we limited our search to studies published between 2003 and 2023. We restricted inclusion to full, peer-reviewed journal articles and conference papers, as these typically provide complete methodological descriptions and undergo editorial and peer-review processes that improve study quality and reduce risk of bias. Posters, work-in-progress papers, extended abstracts without sufficient methodological and non-peer-reviewed records were excluded.

Overall, we identified 79 papers that either (a) discuss or define agency in video games, or (b) report empirical studies measuring agency either as a component of player experience or as part of game design or other interventions.

To guide the search and minimise terminological bias, we defined the following criteria:

- Studies must address agency in video games.
- Papers using alternative terminology referring to related concepts (e.g., player choice, game control) were eligible to reduce blind spots due to inconsistent terminology.
- Publications must fall within the 20-year period from 2003 to 2023.
- Only peer-reviewed journal articles and conference papers in the subject areas of Computer Science, Social Sciences, and Arts and Humanities were considered.
- Studies must pertain to digital/video games; papers using the term ‘game’ in unrelated contexts were excluded.

Because agency is a term used across many disciplines with differing meanings, we refined our query to target usage specifically within video game contexts. For example, the field of *Game Theory* frequently uses the terms game and agency but conceptualises them differently from game studies and HCI research. Therefore, we explicitly excluded game theory from the search.

To capture conceptually relevant terms, we included player choice and game control as additional search keywords. The final SCOPUS search query was:

(TITLE-ABS-KEY (PLAYER CHOICE AND GAMES) OR TITLE-ABS-KEY (AGENCY AND GAMES) OR TITLE-ABS-KEY (GAME CONTROL))
AND KEY (AGENCY OR CHOICE OR CONTROL)
AND PUBYEAR > 2002
AND (LIMIT-TO (SUBJAREA , “COMP”) OR LIMIT-TO (SUBJAREA , “SOCI”) OR LIMIT-TO (SUBJAREA , “ARTS”) OR EXCLUDE (SUBJAREA , “ENGI”))
AND (LIMIT-TO (DOCTYPE , “AR”) OR LIMIT-TO (DOCTYPE , “CP”))
AND EXCLUDE (EXACTKEYWORD , “Game Theory”)

The initial search returned 293 documents.

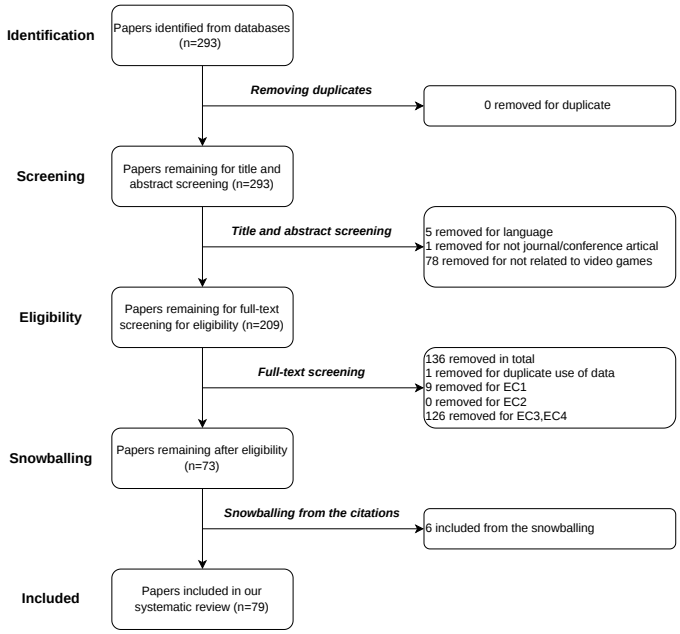


Fig. 1. PRISMA 2020 flow diagram for the study selection process. The diagram shows the number of records identified, screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage.

3.2 Screening

3.2.1 Initial Screening and Full-Text Assessment. Following PRISMA 2020 guidance, we screened all 293 records identified in the database search. Initial title-abstract-keyword screening resulted in the exclusion of 78 records that were outside the scope of this review. These records used terms such as ”game”, ”player” or ”agency” in contexts that did not align with the review’s focus on agency in video games. For example, some records concerned game theory, sport studies, governance or technical control systems. Therefore, these records were removed before full-text screening because they were unlikely to address agency in relation to video games.

We additionally excluded 6 records for reasons of ineligibility: 5 were written in languages other than English or Chinese, and 1 was not a journal article or conference paper. Chinese-language articles were considered eligible because the first author is fluent in Chinese and no translation would be required. Although the only Chinese-language record retrieved had already been excluded at the previous step due to irrelevance to video games, we retained English or Chinese full-text availability as a consistent eligibility criterion. After this stage of screening, 209 records remained for full-text assessment against the predefined eligibility criteria.

During full-text review, we also examined how the term agency was used within each article (e.g., whether it referred to human capacity in general rather than an in-game construct). Only papers addressing agency specifically within a video game context were retained.

3.2.2 Eligibility. Eligibility criteria were derived from the research questions. Papers were required to meet both EC1 and EC2 and at least one of EC3 or EC4:

EC1 **Readability:** Articles must provide full, accessible text and be written in English or Chinese.
EC2 **Game study:** The primary research focus must concern video games or game-related concepts.
EC3 **Agency concept:** The paper must offer a substantive discussion of at least one form of agency and describe how it manifests within video games.
EC4 **Agency measurement:** The paper must describe how agency or agency-related experiences were assessed (objectively or subjectively), or propose a new framework or method for measuring agency.

EC2 was retained as a full-text eligibility check to confirm that papers which appeared relevant at the initial screening stage were substantively focused on video games in the full text. No papers were excluded under EC2 during full-text screening, as all papers reaching this stage satisfied this criterion. To avoid double-counting, when multiple papers reported substantially overlapping findings from the same experimental dataset, we retained the paper most relevant to the review questions.

All remaining records were evaluated against these criteria. We first examined how agency appeared in the article, specifically, whether the discussion addressed agency as it relates to gameplay, rather than as a general human capacity or unrelated theoretical construct.

Nine records were excluded because they were not full papers. During detailed full-text assessment, 126 articles were excluded for not meeting EC3 or EC4, and one article was excluded for duplicate use of experiment data. This resulted in 73 eligible studies. We then conducted backward reference snowballing to identify additional records cited by these studies. Screening these references against the same eligibility criteria yielded 6 further eligible papers. In total, 79 studies were included in the final review.

3.3 Coding & Analysis

After finalising the dataset, we conducted a qualitative coding to address the research questions. The coding process combined a deductive initial structure with inductive refinement during analysis. We first developed an initial codebook aligned with the aims of the review and extracted data across four primary dimensions. The first dimension identified each article's contribution type following the framework proposed by Wobbrock and Kientz [103].

Second, we extracted all definitions and conceptualisations of agency presented in each paper. Third, we examined how agency was operationalised and measured. Finally, we coded discussions linking agency to game elements or player experience. Extracted data were iteratively analysed and organised into categories, forming the basis for the initial codebook.

After the initial extraction, we iteratively analysed the extracted data and grouped them into categories and codes. The review aims guided the initial structure of the codebook, but the final categories and definitions were refined through the analysis of the included papers. Two authors reviewed these preliminary codes, discussed ambiguous cases, and clarified the code definitions.

We conducted three rounds of reliability checking. In each round, 10 randomly selected papers were independently coded by at least one supervising author using the current version of the codebook. Coding results were compared, and any discrepancies were discussed until consensus was reached. These discussions informed further refinements of the coding manual.

Following this process, we finalised a codebook(see appendix A) comprising eight categories, each containing between two and seven codes. The (1) **Research Contribution Type** category [103] captures the research output format. (2) **Conceptualisations of Agency** and (3) **Theoretical Perspectives on Agency** address theoretical foundations and definitional sources. (4) **Methods for Studying Agency** and (5) **Measures and Instruments of Agency** map the methodological

approaches used to assess agency. The category (6) **Primary Research Focus** captures each study's thematic focus, while (7) **Game Design Elements Related to Agency** and (8) **Player Experience Dimensions Associated with Agency** summarise the factors associated with agency in the included literature. Detailed results of these analyses are presented in the following section. The full coding of the 79 papers could be found in Coding.

3.4 Thematic Analysis

After completing the initial coding, we conducted a Reflexive Thematic Analysis (RTA) to obtain further insights into how agency is conceptualised within video games. This analysis focused specifically on descriptive statements extracted from articles coded as either 'Precise Definition' or 'Use descriptive sentences to demonstrate agency' within the category *Conceptualisations of Agency*. RTA is a flexible interpretative approach for analysing qualitative data and supports the identification, interpretation, and organisation of recurring patterns across a dataset. RTA conceptualises meaning-making as occurring through the interaction of three elements: (1) the dataset; (2) the theoretical assumptions guiding the analysis; and (3) the researcher's interpretive skills and analytic sensibilities. Thus, the researcher plays an active, iterative role in theme development.

In this study, we followed Braun et al. [17]'s six-phase process for RTA to examine how prior research has described the concept of agency in video games. First, all extracted statements were read repeatedly to familiarise ourselves with the data. Second, initial codes were generated inductively in NVivo. Third, codes were clustered into potential themes and organised into provisional thematic structures to support further analysis. Fourth, these themes were reviewed and refined to ensure internal coherence and accurate representation of the coded data. Fifth, themes were clearly defined and named, and finally, the analysis was documented in the written report.

In total, fifty-five descriptive statements about agency were analysed. The final thematic structure comprised four interrelated dimensions that capture the principal aspects underlying definitions of agency in the reviewed literature: **player intention**, **freedom and scope of control**, **effectiveness of action**, and **player interpretation**.

4 Synthesis of Findings on Agency in Video Games

4.1 Characteristics of Included Studies

In recent years, there has been growing scholarly interest in the role and impact of agency in video games. As shown in Figure 2, the studies included in this review span from 2005 to 2023. Only a small number of publications appeared between 2005 and 2017, but the volume of research increased steadily thereafter, with a marked acceleration from 2018 onward. This trend indicates that agency has become an increasingly salient topic within game studies and HCI over the past decade.

The distribution of research contribution types across the 79 studies reveals a clear pattern in how the field has developed. Empirical studies constitute the largest group, with 41 publications (51.9%), reflecting a strong emphasis on evidence-based investigations such as experiments, case studies, and data-driven analyses. Opinion pieces (n = 20; 25.3%) and theoretical contributions (n = 17; 21.5%) form the next major categories, suggesting continued efforts to articulate conceptual frameworks and refine foundational understandings of agency.

In contrast, contributions involving artefacts (n = 6; 7.6%), methodological innovations (n = 2; 2.5%), surveys (n = 1; 1.3%), and datasets (n = 1; 1.3%) are comparatively rare. Because several studies offered more than one form of contribution, the total number of contribution-type codes exceeds the number of included papers.

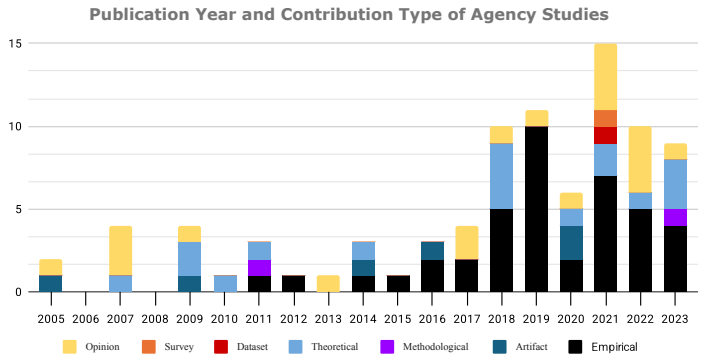


Fig. 2. Publication Year and Contribution Type of Agency Studies

Viewed chronologically, the developmental trajectory of agency research becomes evident. Early work was dominated by opinion-based and theoretical contributions that laid conceptual foundations. Empirical research began to emerge gradually from around 2011 and expanded rapidly from 2018 onward. This growth in empirical work aligns with the overall rise in publications on agency in video games, suggesting a shift from conceptual problem-setting to more systematic, evidence-driven investigation.

Table 1 presents the distribution of included papers across publication venues. These 79 papers were published in 48 distinct venues, with journals (n=39, 49.4%) and conference papers (n=40, 50.6%) being almost equally distributed. Among journals, *Games and Culture* (6), *Convergence* (4), and *Journal of the Philosophy of Sport* (4) were the most represented. For conferences, DiGRA (9) and FDG (7) accounted for the largest proportions. The broad range of publication venues reflects the interdisciplinary nature of research on agency in video games, covering fields such as game studies, media studies, philosophy and education.

4.2 What is Agency?

4.2.1 How Has Agency Been Conceptualised in Previous Studies? Across the 79 studies included in this review, 44.3% (n = 35) provide an explicit definition of agency. Within this group, eight papers employ the term *Sense of Agency (SoA)*, though they conceptualise it differently. Five studies [1, 7, 53, 76, 86] describe SoA as **the feeling of control**. The remaining three [13, 39, 73] interpret SoA as **causal attribution**, emphasising the player's sense of authorship over actions and responsibility for their outcomes. Among the other 25 papers with precise definitions, 15 define agency as a unified construct.

The most frequently used definition is Murray's (n = 6) [6, 18, 20, 36, 40, 96], which describes agency as **"the satisfying power to take meaningful action and see the results of our decisions and choices"** [64]. Although Carstensdottir et al. [21] do not cite Murray directly, their definition similarly foregrounds the meaningfulness of player actions and their consequences in the game world.

The second most frequently used definition comes from Tanenbaum and Tanenbaum, cited in four papers [66, 67, 91, 93]. They define agency as a commitment to meaning, in which the player conveys intent to the system and the game responds accordingly [92]. This reciprocal interaction forms a shared understanding between player and system, conceptualised as a commitment to meaning.

Table 1. Breakdown of included papers by publication venue (N = 79).

Venue	Discipline	Count
Journals		
Games and Culture	Game Studies	6
Convergence	Media Studies	4
Journal of the Philosophy of Sport	Philosophy	4
Journal of Gaming and Virtual Worlds	Game Studies	3
Intl. J. of Human-Computer Interaction	HCI	2
Psychology of Popular Media	Psychology	2
Other (1 paper each)[a]	Various	18
Subtotal		*39*
Conference Proceedings		
DiGRA	Game Studies	9
FDG	Game Studies	7
ICIDS	Interactive Narrative	3
AIIDE	AI and Games	2
Technology and Innovation in Learning (LNCS)	Education	2
Other (1 paper each)[b]	Various	17
Subtotal		*40*
Total		**79**

[a] ACM IMWUT, ACM JOCCH, ACM TAP, ACM TOCHI, Bulletin of Science, Canadian Theatre Review, Computers and Composition, Computers in Human Behavior Reports, Dichtung Digital, Digital Arts and Culture, Digital Creativity, Human-Computer Interaction, Intl. J. of Artificial Intelligence in Education, Intl. J. of Film and Media Arts, Intl. J. of Gaming and Computer-Mediated Simulations, J. of Science and Technology of the Arts, Open Cultural Studies, Philosophical Review.

[b] AAAI, ACM Hypertext, AIED, Audio Mostly, BCS HCI, CHI, CHI PLAY, Cognitive Science Society, DIS, Entertainment Computing and Serious Games, IADIS, IEEE RO-MAN, Interactivity, Game Creation, Design, Learning , IHCI, Learning Analytics and Knowledge, Learning and Collaboration Technologies, Serious Games.

Three studies define agency as the player's ability or capacity to take action [69, 79, 95], while two focus on the concept of player control [23, 80]. Another focuses on the intentional influence on one's functioning and life circumstances [89].

Ten studies further specify distinct types of agency in video games, including system agency [42], illusory agency [19, 55], moral agency [2], gaze agency [88], global and local agency [51, 57, 101], perceived social agency [8], and a multi-type framework introducing four forms of agency [27].

Another 24 papers (30.4%) do not offer a formal definition but instead describe agency through explanatory statements. Six of these papers approach agency from a philosophical or aesthetic perspective [47, 68, 72, 74, 83, 84], conceptualising it as an aesthetic medium of games in which the player's action-taking, decision-making, and temporary adoption of goals and abilities contribute to a distinctive aesthetic experience. Among the remaining 18 studies, ten discuss agency as a holistic construct. Four closely associate agency with control [15, 41, 46, 59], while two break agency down into related subcomponents such as effectance, self-efficacy, controllability; availability, utility and impact [32, 61]. Others highlight particular facets of agency: the role of expectations and system support [99], agency as freedom [75], agency as a form of human ability [62], or agency's dependence on game rules [28].

Eight additional papers discuss different types of agency, including non-human agency (n = 4) [42, 71, 81, 90], narrative agency [42], emotional agency [51], perceived agency [52], invisible agency [50], and corporeal agency [3].

Finally, 22 papers (27.8%) do not provide either a clear definition or descriptive explanation. In many of these cases, agency appears as a variable in empirical studies, for example, within questionnaires, without clarification of what the authors mean by the term. Other studies explore relationships between agency and adjacent concepts while assuming the reader already understands the construct.

In summary, the concept of agency is defined and described in highly diverse ways across the video game literature. Some authors offer explicit definitions, others rely on descriptive or contextual explanations, and a substantial number use the term without clarifying its meaning. Several papers introduce their own variants or types of agency, further illustrating the conceptual complexity and fragmentation of the field. To address the lack of consensus and identify the common elements underlying these heterogeneous definitions, we conducted a RTA of conceptualisations of agency reported in the included studies.

4.2.2 Thematic Analysis of Agency Definitions. To develop a clearer understanding of how agency is conceptualised in the context of video games, we conducted a RTA of all definitions and descriptive statements collected from the literature. From 55 data sources, we identified four overarching themes: (1) **Player intention**, (2) **Freedom and scope of control**, (3) **Effectiveness of action**, and (4) **Player interpretation**. These themes are not discrete categories but interconnected dimensions that together shape the experience of agency. Definitions containing multiple relevant dimensions were coded accordingly. For example, the definition *"The sense of agency refers to a user's feeling of 'I did that' or of being the author or controller of one's actions"* was coded under both **Freedom and scope of control** and **Player interpretation**.

The player intention. This theme captures definitions that focus on the player's ability to act according to their own goals, desires, or purposes. Nine data sources emphasise that agency arises when players can pursue the actions they intend to take. A representative definition describes agency as *"a phenomenon involving both player and game, one that occurs when the actions players desire are among those they can take (and vice versa), as supported by an underlying computational model"* [99]. Another definition states: *"Agency is to influence intentionally one's functioning and life circumstance"* [89]. Across these accounts, the core emphasis lies on supporting the player's intentions—both through enabling desired actions and through ensuring that the system responds in ways that align with players' expectations.

The freedom degree of control. The most common theme, represented in 21 data sources, concerns the degree of freedom players have in controlling actions and outcomes. This theme reflects longstanding interpretations of agency as freedom of action. A typical example describes agency as a *"Sense of control, a feeling of control over the avatar's actions and their consequences [...]"* [1]. Definitions coded under this theme highlight two aspects: the scope of control – what players are able to control – and the *conditions* of that control, such as acting within environmental constraints or using specific modalities like gaze-based input. Some accounts also foreground the source of control, including bodily movements or external devices.

The effectiveness of action. This theme, present in 17 sources, emphasises the meaningfulness and impact of player actions within the game world. It concerns the extent to which player behaviour produces significant, coherent, or expected outcomes, whether immediate or long-term. Murray's influential definition fits within this theme, which emphasising the satisfaction derived from taking meaningful action and observing its consequences. Here, agency is understood as grounded in the

effectiveness of behaviour – its capacity to influence the game state and to be recognised by the system's mechanics.

The player interpretation. The final theme, represented in 16 data sources, focuses on how players understand, interpret, and attribute meaning to the consequences of their actions. This includes interpretation of narrative cues, character behaviour, game mechanics, and causal relationships. One example is the concept of *illusory agency*, which is defined as the *"[...] process of 'tricking' a reader into believing they have greater impact on and import within the game"* [55]. Compared with the previous theme, which centres on the actual effects of player action, this theme emphasises the player's perspective: how they make sense of feedback, attribute causation, and construct meaning from their interactions.

Viewed over time, these themes reveal patterns in the conceptual development of agency. Effectiveness of action appears consistently throughout the literature, forming a core element of many definitions. Player intention is prominent in earlier work but less common in recent studies. In contrast, freedom and scope of control and player interpretation appear more frequently in recent publications, reflecting evolving research interests in embodiment, control modalities, and perceptual aspects of agency.

Taken together, the four themes can be understood as sequentially connected dimensions that structure the experience of agency. A player begins with an intention to act, operates within the degree of control afforded by the game, experiences the effectiveness of their action through system feedback, and finally interprets the outcome in relation to expectations and meaning. Understanding agency through this integrated framework highlights its emergence from the interplay between player cognition, embodied action, and game-system design.

4.2.3 The Source of Agency. Research on video games commonly distinguishes between two principal perspectives on the source of agency. The first understands agency as a property embedded within the game system itself, whereas the second conceptualises it as emerging from the player's subjective experience. Both perspectives are well represented in the literature, and many studies draw on aspects of both.

The first perspective defines agency as an affordance of the game system – an objective, design-oriented view adopted in 51 studies (64.6%). From this standpoint, agency is rooted in the material and computational structures of the game, including its mechanics, algorithms, interface, and overall design logic. Here, agency is conceived as a capability provided by the system, reflected in the objective possibilities for action [95], branching narrative structures [100], and the influence players can exert on the game state [75]. For instance, a game offering multiple routes to an objective or providing a diverse set of tools is seen as affording greater agency through its design. Similarly, map exploration and NPC interaction are often described as high-agency features because they enhance player freedom, usability, and impact on game progression [61].

The second perspective defines agency as a subjective, experiential phenomenon arising during play. Forty-seven studies (59.5%) adopt this view, emphasising that agency is shaped less by system properties and more by the player's perception, interpretation, and meaning-making processes. In this framing, agency is understood through experiences such as a sense of control [88], the formation of intentions [89], and the perceived connection between one's actions and their outcomes [73]. Broader notions of human agency—such as individuals' capacity for reflection, decision-making, and self-determination – also fall within this category. This perspective foregrounds agency as a fundamentally player-centred phenomenon, grounded in subjective evaluation rather than systemic possibility alone.

A closer examination reveals that 19 studies (24.1%) draw upon both perspectives. This overlap suggests that many researchers conceptualise agency as a relational construct arising from the

interplay between system affordances and player cognition. Under this integrated view, agency is neither solely embedded in the game system nor exclusively a matter of player perception; rather, it emerges through the dynamic interaction between what the game enables and how the player interprets and engages with those possibilities.

4.3 Methods for Studying Agency

4.3.1 Research Methods. Across the 41 empirical studies included in this review, we coded the data collection and measurement methods used to assess agency. Fourteen studies used qualitative approaches. Among these, four were case studies: one used interaction mapping [18], one focused on close reading of different games [51], one relied on close play analysis [12], and one combined close reading with autoethnographic reflection [82]. Eight studies [2, 3, 21, 27, 39, 52, 63, 78], conducted interviews to capture players' subjective experiences and interpretations of agency. Additional qualitative approaches included analysis of fan letters [89] and posts on game official forum[20], retrospective protocol analysis on participants' playthrough [52], and an online ethnography examining discussions of agency within a Reddit game community [45].

Twenty-six studies used quantitative methods. Fifteen of these employed questionnaires to measure agency-related experiences, with one also integrating experimental data from the Libet Clock method [13]. Two studies [60, 61] used scoring-based approaches, either by analysing participant gameplay behaviour or by applying predefined evaluative criteria to specific game mechanics. Seven studies within educational contexts treated agency as an independent variable, manipulating its level according to the experimental design [16, 23, 41, 59, 60, 69, 75]. One study [73] used EEG data as a proxy for agency-related cognitive processes, while another [46] did not measure agency directly but examined its mediating role in shaping player experience.

Finally, one study [39] used a mixed-methods design. It first conducted interviews to understand players' conceptualisations of agency, then used these qualitative insights to develop an agency questionnaire focused on game elements, and subsequently collected quantitative data to validate the instrument.

4.3.2 Measures and Instruments of Agency. Of the empirical studies, 16 employed questionnaires to measure agency, and one additional study established detailed scoring criteria. Together, these 16 studies form the basis of our analysis of measurement instruments (summarised in Table2 in Appendix B). Among them, eight used or adapted existing agency-related scales, while seven developed entirely original questionnaire items tailored to their research contexts. One study adopted a hybrid approach, combining items from existing tools with newly developed items.

Among the nine studies drawing on existing instruments, only two used the same scale. Thue et al. [95] applied the *Effectance Questionnaire* from the *IRIS (Integrating Research in Interactive Storytelling) toolkit*, which is a collection of scales designed within this research project focused on interactive storytelling to measure and evaluate users' experiences within interactive narrative systems and video games [49], and Foffano and Thue [32] later incorporated items they developed for *Controllability* and *Self-Efficacy* alongside the *Effectance Questionnaire*. The remaining seven studies each adopted distinct tools. Four of these [13, 15, 62, 76] employed instruments originating from psychology or cognitive science, three [1, 8, 95] adopted scales developed within HCI, and one [24] used a questionnaire created specifically for measuring sense of agency in narrative-based games. However, this latter instrument was designed for a single study and has not undergone broader validation.

Among the eight studies that developed original measurement tools, three [7, 22, 80] focused on assessing players' sense of agency in VR contexts. Two [32, 39] measured agency through specific game elements, examining how features of game design influence agency. The remaining

three instruments targeted discrete components of agency: one measured the effectiveness of game actions [88], one focus on the controllability in the game[53], and the other assessed players' perceived authorship over changes resulting from their actions [100].

4.4 Game Design Elements Related to Agency

To better understand how agency connects to other constructs within video games research, we analysed the thematic focus of the included studies. This analysis resulted in two overarching categories: (1) **Game Elements and Technology**, referring to in-game components, mechanics, system structures, and interaction technologies that afford or constrain agency; and (2) **Player Experience**, encompassing players' thoughts, emotions, perceptions, and subjective interpretations during gameplay.

Across the 79 studies, most (50.6%, n = 40) focused exclusively on Game Elements and Technology, indicating a strong emphasis on the structural and mechanistic determinants of agency. A smaller group of studies (25.3%, n = 20) examined Player Experience alone, framing agency primarily as a subjective psychological or phenomenological construct. Notably, 19 studies (24.1%) addressed both categories, analysing how specific game features influence players' sense of agency and how that sense of agency subsequently shapes, or is shaped by, their experiential processes.

Overall, the predominance of game-element-focused studies suggests that the literature tends to conceptualise agency primarily in terms of the mechanisms, affordances, and technological structures embedded within games. Fewer studies investigate agency from a holistic perspective that integrates system design with player experience, indicating an opportunity for future research to further explore the reciprocal relationship between game structure and player cognition, emotion, and meaning making.

4.4.1 Game Elements and Technology. The 59 articles examining in-game components and mechanisms were further analysed to identify which specific game elements were associated with agency. Four sub-codes were used in this analysis: **Characters**, **Environment**, **Interaction**, and **Narrative**. The distribution of these elements reveals a clear hierarchy of research interest.

The most frequently studied element was **Interaction**, with 26 of the 59 articles (44.1%) coded under this theme. This indicates that the interactive actions players can perform, which distinguish games from non-interactive media, are widely regarded as a key factor shaping player agency. Research in this area focuses not only on player control and players' general interactions with game systems, but also on the external forms of these interactions, such as input methods [13] and the spatio-temporal positioning of the player [3]; the representation of players' hand interactions within the game [7, 80]; and the impact of latency in VR games on agency [22, 46, 88].

The second most frequently coded element was **Narrative**, appearing in 22 papers (37.3%). This element includes storytelling, plot structures, and supplementary paratextuality [82, 87] that accompany games. Research focusing on narrative and agency commonly examines branching storylines, the illusion of choice [19, 55], and the player's ability to affect the outcome of the game's story. The central focus here is how pre-written content can be altered or combined with player actions, demonstrating that narrative structures play an important role in shaping agency.

A smaller but still substantial number of articles, 15 (25.4%), examined **Characters**. Research in this category primarily focuses on the player avatar (n = 10), followed by non-player characters (NPCs) [14, 20, 51, 71] and teammates [62]. Studies in this group often explored how the abilities [39], limitations [12], customisation options [52, 55], and identity [73, 89] of the player-character mediate or restrict agency. This suggests that the 'who' of the action is a substantial concern in the literature, frequently intersecting with questions of player identification and embodiment.

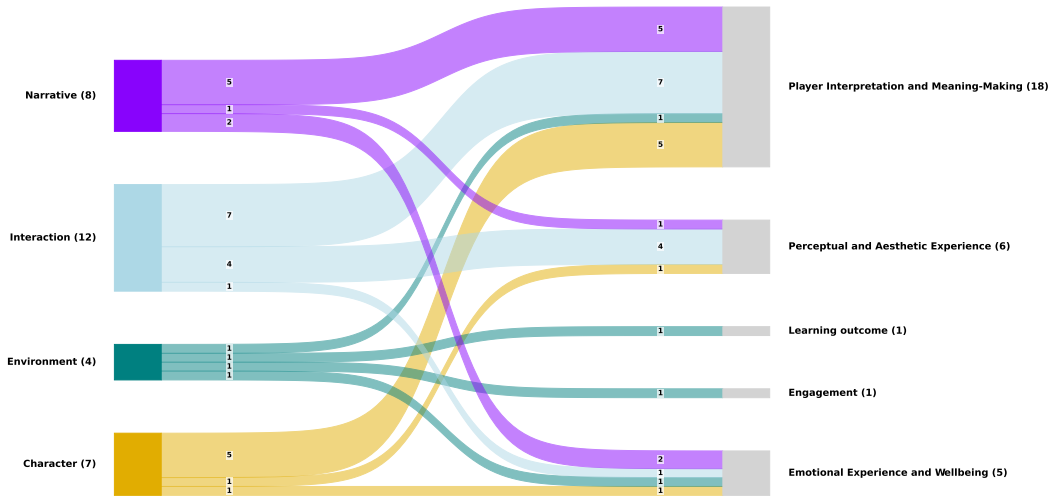


Fig. 3. Sankey diagram mapping the relational flow between game design elements (Sources) and dimensions of player experience (Targets), as documented in this systematic literature review. The width of the flows is proportional to the frequency of studies identifying specific correlations, with numerical values provided at the edges of each path to indicate the absolute paper count. (Colour key: Mustard = Character; Teal = Environment; Light Blue = Interaction; Purple = Narrative).

Finally, the least frequently studied element was **Environment**, appearing in 14 articles (23.7%). This sub-code includes the shaping of the game's internal environment, such as visual elements, physical layout, and constraints of the game world. Relevant studies examined the visual presentation of game spaces, including graphic imagery [6, 44], interface and content design [24, 41], rule design [28], and the impact of external game-developer updates on player agency [45]. Although less prevalent than the other three elements, this finding indicates a significant research interest in how the spatial and sensory design of the game world contributes to both the feeling and the enactment of agency.

4.4.2 Player Experience. The 39 articles that addressed player experience were further analysed to determine which specific aspects of player experience were connected to agency. Six codes were used for this analysis, with multiple codes applicable to a single article. The results reveal a complex and multifaceted understanding of how agency relates to players' subjective experiences.

The most prominent aspect of player experience linked to agency was **Player Interpretation and Meaning-Making**, detailed in 16 of the 39 relevant articles. This refers to players' individual understanding, explanation, and self-narration of the fictional elements and their actions. Among these 16 studies, nine examine how players interpret narrative [21, 27, 42, 63], characters [26, 31, 55, 71, 86], and their own actions [2]. Six studies focus on how players interpret their intentions and communicate with the game system [52, 66, 67, 91, 93]. One study details how players' causal attribution for failure in a game is affected by their perception of agency [62]. Taken together, these findings point to a research interest in the interpretive dimension of agency, where the freedom to act within the game adds to the player's personal process of meaning-making and the shaping of their own unique play narrative.

The second most studied aspect was **Perceptual and Aesthetic Experience**, appearing in 14 articles (35.9%). This encompasses players' awareness or feeling of themselves and other non-material concepts within games. The most frequently discussed concept originates from philosophy, with agency linked to players' aesthetic perceptions in five of these studies [68, 72, 74, 83, 84]. The remaining work examines the relationship between agency and players' perception of latency [46, 88], temporal awareness [3, 86, 88], the AI manager within games [32], culture background [53] and teammates during gameplay [62].

Following closely, **Emotional Experience and Wellbeing** was examined in eight articles (20.5%). This includes changes in both positive and negative emotions experienced during gameplay and the psychological benefits associated with agency. Positive aspects include enjoyment [16, 69], children's mental wellbeing, especially for those who are originally with low-level wellbeing [75], and reductions in emotional difficulties [2]; and negative emotions include horror [18]; and the effect of agency is not significant on cognitive loading under the context of education [59]. Additionally, agency is connected to emotional responses arising from the sentimental value of characters [51] and from players' emotional investment in the game [21].

Six studies in the education area explored the relationship between agency and *learning outcomes* [23, 41, 58–60, 69]. A final aspect, *Engagement*, includes two studies that investigated how the design of agency could improve player involvement [78, 96].

While previous analyses show how often each game element and each player experience dimension appeared across the full corpus, they do not show how particular game elements were connected to particular experiences through agency within individual studies. To examine these relationships in more detail, we focused on the 19 studies that explicitly addressed both categories and coded each source-target pairing in these studies. This produced 31 pairings, which are shown in Figure 3.

Among the game elements, Interaction was the most frequently paired category (n = 12), followed by Narrative (n = 8), Character (n = 7), and Environment (n = 4). Among the player experience aspects, Player Interpretation and Meaning-Making account for the largest share of pairings (n = 18) and received links from all four game element categories. Other player experience dimensions were represented less frequently, with Perceptual and Aesthetic Experience and Emotional Experience and Wellbeing constituted smaller clusters, while Learning Outcome and Engagement appeared only once each.

The pairings also suggest different patterns in how game elements were linked to player experience. Interaction was mainly associated with interpretive and perceptual experience, while Narrative and Character showed a broader but still interpretation centred pattern. Environment appeared less frequently overall, but its links were spread across a wider range of player experience dimensions. Overall, Figure 3 suggests that studies connecting game elements to player experience have mainly focused on how players interpret and perceive game elements.

The analysis of how agency interacts with other topics shows that the literature is shaped by two main directions: the structural side of games and the subjective side of players.Most studies focus on game elements and technology, emphasising how mechanics, systems, and story structures frame the possibilities for player action and the consequences that follow. At the same time, a smaller but meaningful body of work connects agency to player experience, arguing that the impact of agency cannot be fully understood without considering how players engage with and reflect on the video game context.

Across both directions, interaction, narrative, character, and environment emerge as key structural elements, while interpretation, perception, and emotion capture the player-centred dimensions of agency. Taken together, these findings suggest that agency is understood not only as a product of design, but also as a lived experience shaped by how players interpret and respond to games. This

dual perspective highlights the importance of integrating both design-focused and experiential approaches in order to develop a more comprehensive understanding of agency in video games.

5 Discussion

5.1 Conceptual Fragmentation of Agency

First, there is no widely accepted or consistently used concept of agency, which creates challenges for coherence within this field of research. While some studies adopt shared definitions or build on one another's work, most develop their own operationalisation of agency. This diversity may partly reflect the fact that agency is a complex and multi faceted phenomenon that is approached from different theoretical and disciplinary perspectives. At the same time, it has also produced a fragmented body of literature in which findings are difficult to compare, aggregate, or integrate. The conceptual fragmentation not only hinders theoretical development but also constrains empirical progress: without clear boundaries or a shared understanding of which aspect of the construct, it becomes difficult to establish comprehensive and reliable evaluation frameworks or to build cumulative knowledge across studies.

Second, the conceptual boundaries of agency are also unclear. This ambiguity is largely due to the lack of general agreement on what agency encompasses. In recent years, there have been multiple interpretations of agency from different perspectives. Beyond traditional discussions centred on game elements such as narrative, game mechanics, and characters, several studies have approached agency from aesthetic perspectives or have offered humanistic reflections on the nature of agency in games. These interpretations, while useful for expanding the scope of the concept, have also introduced additional layers of complexity, making the scope of agency increasingly diffuse. Rather than treating this variation as a problem to be eliminated, it may be more productive to view it as evidence that agency operates across multiple levels of analysis. A key task for future research is therefore to make clear which dimension of agency is being examined in a given study, and for what purpose.

Finally, the connections between agency and related concepts remain somewhat blurred. This is especially evident in its relationship with terms such as self-efficacy, embodiment, and autonomy. For example, in Foffano and Thue's study [32], self-efficacy was conceptualised as a component of agency, whereas in another study, agency was treated as a related experience of effectance that is distinct from, and not directly linked to self-efficacy [25]. Similarly, autonomy and agency have often been used interchangeably in certain papers, a trend that is not unique to game studies but can also be observed more broadly across HCI research [11]. These overlaps do not necessarily imply that these concepts are entirely identical, but instead indicate that the boundaries between them are often only partially defined.

Such subtle overlaps are also found in our RTA of agency definitions. Unlike the multidimensional concept of agency, autonomy research has developed a relatively mature framework within video games and HCI. Common definitions of autonomy stem from Self-Determination Theory (SDT), referring to a sense of control over one's actions and the capacity to make choices aligned with personal values and interests. It may also be understood as the willingness to perform tasks [85], placing greater emphasis on players' perceived control over decision-making. When combined with our RTA framework from Section 4.2.2, particularly concerning the themes of 'The player intention' and 'The freedom degree of control', significant overlap exists between the concepts of agency and autonomy. It is important to note, however, that this does not imply complete equivalence between the two in these specific aspects. As discussed in Section 4.2.2 regarding the 'Player intention', fulfilling player intent involves not only the player being able to perform desired actions, but also how the video game system responds in a way that aligns with expectations. The former shares

similarities with the concept of autonomy, while the latter constitutes an aspect of agency distinct from autonomy. Similarly, under the theme 'The freedom degree of control', when 'control' is exercised over the player themselves, i.e., when players feel control over decision-making and action-taking, this sense of control is considered to overlap with autonomy. When the object of the player's control is not the player themselves, such as in-game objects, events, or narrative, it is regarded as a sense of control unique to agency. Additionally, the terminology used to refer to agency is also inconsistent. Besides studies focusing on specific forms of agency, some have used the term sense of agency instead. Originating from psychology, sense of agency carries subtle but meaningful distinctions from the general use of agency, which can lead to further conceptual confusion. Future work would benefit from stating more explicitly whether it is examining autonomy, agency, or sense of agency, and from clarifying where these constructs overlap and where they distinct.

5.2 Limitations of Current Agency Measurement Approaches

Similar to the conceptual issues mentioned above, there is no unified approach to measuring agency. As described in Section 4.3.2, some studies have adopted questionnaires from psychology that measure sense of agency, while others have developed their own items or instruments tailored to specific research goals. To date, only one validated questionnaire has been specifically designed to measure agency in the context of video games [39]. This tool focuses primarily on assessing players' sense of agency (SoA) through elements of game design and mechanics. Although it has undergone validation, it has not yet been used or tested in other studies. Moreover, as our thematic analysis shows, significant aspects of agency relate to players' interpretations, expectations, and subjective experiences – dimensions that are not easily captured through game-element-based measures. Therefore, a more useful next step could be to develop a set of clearly scoped and validated measures that align with different definitions of agency, while also accounting for player experience rather than relying solely on structural or mechanical elements.

Beyond subjective questionnaires, a few studies have explored some objective methods for measuring agency, such as electroencephalogram (EEG) [73] recordings and the Libet clock experiment [13]. However, both approaches face significant limitations. EEG-based measurements do not fully capture player agency as it occurs within games; rather, they reflect a general sense of agency as a human subject performing experimental tasks after gameplay. Similarly, the Libet clock experiment does not involve a gaming context and relies on highly controlled, simplified settings. Given the complex and dynamic nature of game environments, it is currently very difficult to obtain reliable objective data on agency using such methods.

In summary, current measurement practices rely heavily on questionnaires, and there is still no reliable instrument that captures agency from the perspective of player experience. However, this does not necessarily mean that future research should aim for a single universal metric. Instead, future work should establish stronger links between conceptual definitions, research questions, and measurement choices, while developing and validating tools that capture both the subjective and contextual aspects of how players experience and interpret agency within interactive environments.

5.3 Relationships Between Agency and Related Constructs

The analysis of how agency connects with other concepts in video game research shows a strong tendency to focus on game elements and technology over player experience. As discussed in Section 4.4, the majority of reviewed articles examine in-game components and mechanisms such as interaction, narrative, and characters. This focus has deepened our understanding of how game design structures or mediates agency, yet it also highlights an important gap concerning its relationship with players' subjective experiences and other psychological constructs.

The Sankey analysis (Figure 3) further clarifies this pattern by showing how specific game elements were linked to specific player experience dimensions in studies that addressed both categories. Interaction, narrative, character, and environment were all connected to player experience, but these links were mainly concentrated around player interpretation and meaning-making. This suggests that when agency is discussed as a bridge between game structures and player experience, it is most often understood through how players interpret, evaluate, and assign meaning to game elements. From this point of view, agency is not only shaped by the availability of choices, narrative branches, character traits, or environmental features, but also by how players interpret these structures within the game context.

At the same time, this analysis also identified what remains under explored. Emotional experience and wellbeing, learning outcomes, and engagement were much less frequently connected to game elements through agency. This does not mean that these aspects are unimportant, but indicates that the current literature has not yet examined them in the same level of detail. One of the possible reasons is that, because there is no consistently accepted definition of agency, researchers have naturally focused on the most tangible and observable aspects of games. By analysing how particular design choices, such as branching narratives or character customisation, generate or influence agency, many studies have used game structures as indirect means of defining the concept. This approach has helped to advance the field by identifying how agency emerge from game content, but it has also shifted attention toward game mechanics instead of how players feel and act while playing.

Another possible reason is related to the measurement approaches used in existing studies. As discussed in Section 4.3.2, because most studies use structure-based measures, it is hard to understand how players personally feel agency. The lack of reliable tools that can show agency as a lived and interpreted experience has become a major barrier to progress. Without such tools, it is difficult to study how agency connects with other parts of player experience, such as emotion, motivation, and learning. As a result, most research still focuses on the inner parts of games instead of on the personal and psychological sides of how players experience agency.

In addition to this tendency, the existing research also pays limited attention to connections between agency and factors that extend beyond the core gameplay context. Although some studies have briefly examined relationships between agency and player-centred aspects such as engagement or emotional experiences, few have developed detailed theoretical discussions that clarify how agency relates to closely linked constructs including self-efficacy, embodiment, and autonomy. These terms are often used interchangeably, which further complicates the conceptual landscape. Recently, Xu et al. [104] explored how this construct relates to and potentially diverges from similar experiences, but further empirical work is necessary to validate this model. Clearer distinctions between these constructs are needed to understand how agency operates within and beyond the game environment. Moreover, little is known about how agency relates to players' identity, their social interactions outside the game, or any long-term behavioural changes that may result from gaming experiences. Addressing these gaps would help the field move from isolated concept use towards a more cumulative account of how agency functions across different contexts of play.

Overall, the fragmented state of the literature and the lack of a shared definition of agency continue to hinder theoretical and methodological development. This conceptual uncertainty not only prevents the creation of reliable and consistent measurement tools but also directs research towards tangible game elements at the expense of subjective experience. As a result, there has been limited progress in understanding how agency connects with wider psychological and experiential aspects. Future work should, therefore, aim to clarify which form or dimension of agency is under study, and develop methods that reflect how players experience and interpret it. Establishing such conceptual and methodological foundations will allow researchers to move beyond analysing game

structures and to explore the broader psychological meanings and implications of agency within HCI and video game research. In this sense, progress would depend less on forcing a single definition, and more on establishing clearer and more transparent links between concepts, measurement criteria and research objectives.

5.4 Limitation of this Study

Several methodological limitations should be acknowledged when interpreting the findings of this review. The first limitation is the database and source of this review. This review relied on SCOPUS as the sole database for the main literature search. While Scopus offers broad multidisciplinary coverage, it may not capture all relevant literature. Studies exclusively in other databases, such as ACM Digital Library, IEEE Xplore, may therefore have been missed. Additionally, the restriction to full journal articles and conference papers meant that early access publications, workshop papers, work-in-progress papers, and books were excluded, which may result in the missing of research from disciplines where books and extended abstracts serve as the primary platforms for theoretical development. Furthermore, the language restriction to English and Chinese also limit the range of research.

Further limitations relate to the conduct of the review itself. This systematic literature review was largely conducted by a single researcher. While this helped keep the application of the inclusion and exclusion criteria consistent across stages, single-reviewer screening also carries a recognised risk of missing relevant studies compared with independent double screening [97]. The screening and analysis followed the PRISMA guidelines [70], with reflexive thematic analysis [17] applied as one step within the wider review process. This approach provided a structured basis for the analysis while also acknowledging the active role of the researcher in selecting and interpreting the evidence [56]. Decisions at each stage were shaped by the researcher's disciplinary background, theoretical stance, and developing understanding of agency in video games. As the review progressed, the researcher's own conceptual framework was also refined, which may have influenced judgements about which studies fell within the scope of the review during the earlier screening stages.

6 Conclusion

This review examined how agency in video games has been defined, measured, and connected to other aspects of games and player experience. Through a systematic screening and coding process, drawing on PRISMA-style selection criteria, qualitative analysis, and multiple reliability checks, we analysed both conceptualisations and empirical approaches to agency. The review also incorporated a reflexive thematic analysis of 55 definitional statements and a structured examination of measurement practices, providing a comprehensive picture of the current state of agency research in video games.

The findings highlight three main points. First, our review shows that agency research in video games lacks a shared conceptual basis, and this is the most important challenge identified. Across the studies we analysed, agency is described through separate and occasionally conflicting ideas, which makes it difficult to establish a coherent and cumulative body of knowledge. This conceptual fragmentation influences how empirical studies are designed and how agency is operationalised and measured. As a result, connections between agency and other aspects of games remain loosely defined or only indirectly explored.

A second key finding is the limited availability of suitable questionnaires. Although questionnaires are the main tool used in empirical work, the number of validated instruments is very small, and most studies rely on items designed for specific projects rather than standardised scales. Only a few tools originate from the game context, and many others were borrowed from psychology or cognitive science without adaptation for interactive media. This lack of validated, game-specific

measures restricts comparability across studies and slows the development of stable methodological practices.

Third, research still pays more attention to structures inside games than to agency as a subjective experience. Many studies focus on interaction, narrative, or characters, which deepens understanding of design practices but leaves key psychological and experiential questions underexamined.

These findings point toward several future directions. Work that develops clearer conceptual grounding may help researchers explain which aspect of agency they are studying and how this relates to their empirical methods. New measurement tools should draw on existing themes and theoretical insights while also distinguishing agency from related constructs, such as autonomy, to reduce conceptual overlap. Finally, future research should broaden its focus to include a wider range of player experience phenomena, including engagement, emotional experiences, and personal meaning, to advance a more balanced understanding of agency that incorporates both design structures and player interpretation. This would help shift the field from structure-centred analysis to a more balanced understanding of how players interpret their own influence within game environments.

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Appendices

A Codebook

Conceptualisation of Agency

How do the authors conceptualise agency in the paper? Specifically, what format is used to present their understanding of agency?

(3 codes. Multiple codes may apply if more than one type of agency is described. Compulsory.)

Precise definition: Authors provide an explicit definition of agency, using formulations such as "XX agency is ..." or "agency represents ...".

Descriptive explanation: Authors describe agency through explanatory or descriptive sentences, using formulations such as "agency arises when ..." or "agency emerges ...".

Other: Authors do not provide a clear definition of agency, instead referring to implicit, vague, or highly context-specific examples.

Perspective of Agency

On what assumptions is the existence of agency in the article based? Specifically, is agency treated as a material and objective property of the game, a subjective and experiential phenomenon of the player, or a combination of both?

(2 codes. Multiple codes may apply. Compulsory.)

Game affordance: Agency is described as a property or capability offered by the game itself, grounded in its material structure, mechanics, algorithms, and design features.

Player experience: Agency is described as an experiential phenomenon emerging from players' perceptions, cognition, and gameplay experiences. This category also includes references to human agency derived from players' status as human actors.

Type of Contribution

Based on Bobrick and Kientz, "Research Contributions in Human–Computer Interaction" (2016), what type(s) of research contribution does the paper make?

(7 codes. Multiple codes may apply. Compulsory.)

Artifact: The paper contributes knowledge about agency through the design, creation, or implementation of interactive artifacts.

Methodological: The paper contributes methodological insights related to how agency is studied or evaluated.

Theoretical: The paper proposes new or refined concepts, definitions, models, principles, or frameworks related to agency.

Dataset: The paper introduces a new dataset or corpus related to agency, accompanied by analysis for use by the research community.

Survey: The paper synthesises existing research on agency through surveys, systematic reviews, or meta-analyses to identify trends and gaps.

Opinion: The paper aims to influence readers' perspectives on agency-related topics through argumentation or persuasion.

Agency Research Method

What research methodology is used to collect data related to agency?

(3 mutually exclusive codes.)

Qualitative methods: Qualitative approaches are used to study agency, including interviews, focus groups, auto-ethnography, or case studies.

Quantitative methods: Quantitative approaches are used to study agency, including surveys and controlled experiments.
Mixed methods: Both qualitative and quantitative methods are employed to study agency.

Instruments Used to Evaluate Agency

What types of instruments are used to evaluate agency in video games?
(2 mutually exclusive codes.)

Existing measures: The study uses or adapts previously established instruments to measure agency in video games.
Self-developed measures: The study develops new instruments or measures tailored to its specific research context.

Research Focus

Which conceptual focus does the paper emphasise in relation to agency?
(2 codes. Multiple codes may apply. Compulsory.)

Game elements and technology: The paper focuses on in-game components, mechanics, or technological systems and how they influence agency.
Player experience: The paper focuses on players' cognitive, emotional, or experiential responses and how these are shaped by agency.

Game Elements Affecting Agency

If the paper focuses on game elements, which specific elements are examined in relation to agency?
(4 codes. Multiple codes may apply.)

Character: The paper examines game characters, including player avatars, non-player characters, or other acting entities within the game.
Environment: The paper examines game environments, including spatial design and visual or auditory elements.
Interaction: The paper examines player actions and interactive mechanics that distinguish games from passive media.
Narrative: The paper examines storytelling elements, narrative structures, or paratextual components associated with the game.

Player Experience Aspects Affected by Agency

If the paper focuses on player experience, which aspects of player experience are examined in relation to agency?
(5 codes. Multiple codes may apply.)

Emotional experience and wellbeing: The paper examines players' emotional responses, including positive and negative emotions, as well as aspects of mental wellbeing during gameplay.
Engagement: The paper examines player engagement, including participation levels, immersion, and intentions to continue or replay the game.
Interpretation and meaning-making: The paper examines how players interpret game events, construct meaning, and rationalise their own actions.
Perceptual and aesthetic experience: The paper examines perceptual or aesthetic aspects of gameplay, such as perceptions of time, latency, sensory feedback, and aesthetic appreciation.
Learning outcomes: The paper examines learning-related outcomes resulting from gameplay, particularly in educational game contexts.

B Measurement instruments and operationalisations of agency

Table 2. Measurement instruments and operationalisations of agency used in empirical video-game studies (2003–2023), including questionnaire items as used in the articles, scoring procedures, conceptual definitions quotes from these articles, and associated themes. Themes are abbreviated as follows: (E) Effectiveness of action; (F) Freedom and scope of control; (I) Player interpretation; (A) Player intention.

Article	Agency items	Definition	Themes
Thue, et al. (2011) A computational model of perceived agency in video games [95]	6 items from the IRIS Effectance scale rated from 1 = Strongly disagree to 5 = Strongly agree: 1. My inputs had considerable impact on the events in the story. 2. I had the feeling that I could affect directly something on the screen. 3. The consequences of my inputs were clearly visible. 4. I could recognize which events in the story I have caused with my inputs. 5. My decisions clearly influenced how the story went on. 6. I discovered how my earlier actions influenced what happened later in the story.	*"Agency, being one's ability to perform an action and have some influence over the world."*	(E)
Foffano & Thue (2019) Changes of user experience in an adaptive game: a study of an AI manager [32]	11 items across three dimensions are rated from 1 = Strongly disagree to 5 = Strongly agree. *Effectance:* 1. I had the feeling that I could affect directly something on the screen. (IRIS) 2. The consequences of my inputs were clearly visible. (IRIS) 3. I could recognize which events in the story I have caused with my inputs. (IRIS) 4. My inputs had a little impact on the events in the game. *Controllability:* 1. It is easy to behave freely in the game. 2. I believe I have the ability to obtain the results that I deserved in the game.[5] 3. I'm certain that my actions could have the consequences that I expected from the game. [5] *Self-efficacy:* 1. I feel that the game is beyond my control. 2. I feel free to behave as I want during the game. 3. I feel that the game limited my abilities. 4. I feel supported by the game.	*"…three concepts in this agency questionnaire: Effectance, Controllability, and Self-Efficacy."*	(E); (F); (A)
Polito & Hitchens (2018) Digital Media Impacts Multiple Aspects of Self-Representation: An Investigation of Flow, Agency, Presence, Character Identification, and Time Perception [76]	The Sense of Agency Rating Scale (SOARS; [77]), 10 items rated from 1 = Strongly disagree to 7 = Strongly agree): 1. Doing what I was meant to was hard. 2. I chose how to respond. 3. My experiences and actions felt self-generated. 4. I went along with my experiences freely. 5. My experiences and actions were under my control. 6. I felt that my experiences and actions were not caused by me. 7. My experiences and actions occurred effortlessly. 8. I was mostly absorbed in what was going on. 9. My responses were involuntary. 10. I was reluctant to go along with my experiences.	*"Sense of agency is a measure of the subjective feeling of self-control."*	(F)

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Article	Agency items	Definition	Themes
Christensen, et al. (2018) The engagement effect of players' agency over their characters' motivation [24]	Two items from [30]'s *Illusion of agency* questionnaire (5-point Likert scale): 1. When playing the game, I was able to see the results of my actions. 2. I felt that the story would have been different if I had made different choices.	No definition or descriptive statements for agency provided.	N/A
Bowey, et al. (2019) Red or blue pill: Fostering identification and transportation through dialogue choices in RPGs [15]	Items from the Sense of Agency Scale [94], rated from 1 = Strongly disagree to 7 = Strongly agree): 1. I am in full control of what I do. 2. I am just an instrument in the hands of somebody or something else. 3. My actions just happen without my intention. 4. I am the author of my actions. 5. The consequences of my actions feel like they don't logically follow my actions. 6. My movements are automatic—my body simply makes them. 7. The outcomes of my actions generally surprise me. 8. Things I do are subject only to my free will. 9. The decision whether and when to act is within my hands. 10. Nothing I do is actually voluntary. 11. While I am in action, I feel like I am a remote controlled robot. 12. My behavior is planned by me from the very beginning to the very end. 13. I am completely responsible for everything that results from my actions.	*"Having the ability to choose autonomously allows for people to consciously exert control over the environment, resulting in a satisfied need for control and a feeling of agency."*	(F)
Bergström, et al. (2019) Sense of Agency and User Experience: Is There a Link? [13]	Three items adapted from previous work: 1. It felt like I was in control of the movements during the task. (From 1 = Strongly disagree to 7 = Strongly agree; [54]) 2. What is the degree of control you felt? (From 1 to 6; [9]) 3. Indicate how much it felt like pressing/tapping the button/touchpad/arm caused the spacecraft to shoot. (From 1 = Not at all to 7 = Very much; [29]).	*"The sense of agency refers to a user's feeling of 'I did that' or of being the author or controller of one's actions."*	(I)
Banks & Carr (2019) Toward a relational matrix model of avatar-mediated interactions [8]	Perceived social agency measured using 7-point semantic differential scales, including: 1. A 5-item scale of explicit anthropomorphism[10]. 2. A 12-item scale for social presence[48]. 3. A 5-item scale for electronic propinquity[98].	*"This perceived social agency – the degree to which an entity conveys cues interpreted to be sufficiently human or humanlike as to activate human-interaction schema."*	(I)
Ahuja, et al. (2019) CoolMoves: User Motion Accentuation in Virtual Reality [1]	Embodiment questionnaire [38] with an Agency subscale (4 items) rated from −3 to 3: (A) It felt like I could control the virtual body as if it was my own body. (B) The movements of the virtual body were caused by my movements. (C) I felt as if the movements of the virtual body were influencing my own movements. (D) I felt as if the virtual body was moving by itself. Agency score = $2A + 2B + 2C - 2D$.	*"SoA: a feeling of control over the avatar's actions and their consequences."*	(F)
Caserman, et al. (2019) Effects of End-to-end Latency on User Experience and Performance in Immersive Virtual Reality Applications [22]	Single item rated from −3 = Strongly disagree to 3 = Strongly agree: *"My movements caused the movements of the virtual body in the mirror."*	No definition or descriptive statements for agency provided.	N/A

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Article	Agency items	Definition	Themes
Miyake, et al. (2021) Mind perception and causal attribution for failure in a game with a robot [62]	Japanese version of the Mind Perception Questionnaire [65]. Agency-related domains include: Memory, Morality, Self-control, Communication, Planning, Thought, Emotion. Example item: *"How much is the partner capable of memorizing something?"* (memory).	*"…abilities such as thinking, planning, and self-control."*	(F)
Ware, et al. (2021) Multi-agent narrative experience management as story graph pruning [100]	Participants played two versions of the game and then indicated which version better matched each statement. Agency item: *"My actions had a significant effect on the story."*	No definition or descriptive statements for agency provided.	N/A
Slobodenyuk (2022) Predictors of gaze agency in gaze-controlled interfaces [88]	Single gaze-agency item, 6-point Likert scale ("definitely me" = 6 to "definitely not me" = 1): Question: whether the participant or the computer switched the display.	*"The sense of control over gaze-contingent interface change is referred to as gaze agency."*	(F)
Guo & Lo (2024) An empirical framework for understanding a player's sense of agency in games [39]	SoA is measured as four dimensions. Each item is anchored to 1-7 Likert scale responses: *Multisensory presentation* 1. How to control the game seems to be: very unintuitive–very intuitive. 2. How my controls are reflected in the actions of the avatar is: very inaccurate–very accurate. 3. How the avatar itself and its actions seem to be: very disharmonious–very harmonious. 4. I feel that I am controlling the avatar to act in a way that is: very rhythmless–very rhythmic. *Feedback reasoning* 5. How the game reacts to my control is: very unresponsive–very responsive. 6. The interaction of the avatar with other objects appears to be: very unreasonable–very reasonable. 7. The avatar's actions and its effects on other objects appear to be: very incoherent–very coherent. *Virtual realism* 8. When controlling the game, the game world looks: very unrealistic–very realistic. 9. My feeling for my control avatar is: very non-empathetic–very empathetic. 10. The sense of power that the avatar exhibits when performing actions is: very unnoticeable–very noticeable. *Control smoothness* 11. The process of controlling the game is: very unsmooth–very smooth. 12. How the game recognizes my control is: very insensitive–very sensitive.	*"Sense of agency (SoA) [is] the experience of perceiving a causal link between one's intentional motor actions and the sensory consequences of those actions on external events."*	(I)
Balcomb, et al. (2023) The Effects of Hand Representation on Experience and Performance for 3D Interactions in Virtual Reality Games [7]	Single item rated from 1 = Don't agree at all to 10 = Fully agree: I felt like I had control of the Sphere/Controller/Realistic hands in this task.	*"The sense of agency is the feeling of control over your actions in a virtual environment."*	(F)
Lee & Sah (2022) Cultural differences in digital Game experiences: Psychological Responses to Avatar and Game environments [53]	Three items rated from 1 = strongly disagree to 7 = strongly agree: 1.During the game, it felt like I was in control of the diver. 2.During the game, it felt like I could move the diver as I intended. 3.During the game, it felt like the diver was out of my control.	*"The sense of agency in a digital game play is a player's subjective feeling that he or she is in control of an avatar's movements and exert influence on the digital game environment."*	(F) ; (E)

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Article	Agency items	Definition	Themes
Rosa, et al. (2019) The supernumerary hand illusion in augmented reality [80]	Single item rated from 1 = Strongly disagree to 7 = Strongly agree: It seemed as if I was controlling the virtual hand.	*"The sense of having motor control."*	(F)

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