

T.C.
BAHCESEHIR UNIVERSITY
GRADUATE SCHOOL
THE DEPARTMENT OF COMMUNICATION DESIGN

PLAYING WITH MEANING:
A THEMATIC ANALYSIS OF COMMUNICATION LIMITS
IN BOARD GAMES

MASTER'S THESIS
MELTEM GULCIN KARADAYI

ISTANBUL, 2024

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ABSTRACT

PLAYING WITH MEANING: A THEMATIC ANALYSIS OF COMMUNICATION LIMITS IN BOARD GAMES

Meltem Gülçin, Karadayı
Master's Program in Game Design
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This thesis investigates the role of communication limits in shaping player interactions, strategies, and experiences in three popular board games: Hanabi, Codenames, and Dixit. By applying Jakobson's communication model and the MDA (Mechanics, Dynamics, Aesthetics) framework, the study conducts a thematic analysis to explore how communication constraints influence decision-making under uncertainty, social interaction, and emotional experiences within these games. The findings offer valuable insights for the design of both physical and digital games, highlighting the critical role of communication in crafting engaging and meaningful player experiences.

Key Words: Board Games, Communication Limits, Game Design, Player Interaction, Social Dynamics

ÖZ

ANLAMLARLA OYNAMAK: MASA OYUNLARINDA İLETİŞİM SINIRLARININ TEMATİK ANALİZİ

Meltem Gülçin, Karadayı
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Bu tez, Hanabi, Codenames ve Dixit adlı üç popüler masa oyununda iletişim sınırlarının oyuncu etkileşimlerini, stratejilerini ve deneyimlerini nasıl şekillendirdiğini incelemektedir. Jakobson'un iletişim modeli ve MDA (Mekanikler, Dinamikler, Estetik) çerçevesini uygulayarak, çalışma, iletişim kısıtlamalarının bu oyunlarda belirsizlik altında karar verme, sosyal etkileşim ve duygusal deneyimler üzerindeki etkisini keşfetmek için tematik bir analiz yapmaktadır. Bulgular, hem fiziksel hem de dijital oyunların tasarımı için değerli içgörüler sunmakta, iletişimin oyunculara anlamlı ve ilgi çekici deneyimler sunmadaki kritik rolünü vurgulamaktadır.

Anahtar Kelimeler: Masa Oyunları, İletişim Sınırları, Oyun Tasarımı, Oyuncu Etkileşimi, Sosyal Dinamikler

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A. Codebook	Hata! Yer işareti tanımlanmamış.

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Figure 1 Shannon&Weaver Communication Model



LIST OF ABBREVIATIONS

MDA	Mechanics, Dynamic, Aesthetics
AI	Artificial Intelligence



Chapter 1

Introduction

Communication plays a pivotal role in gameplay, especially in board games where it functions as both a tool and a challenge. While many games allow players to share information freely, others impose strict communication limits, creating distinct dynamics that shape how players strategize, cooperate, and compete. These constraints often intensify the tension, stimulate creativity, and demand higher levels of coordination, as players must skilfully navigate the rules that govern their interactions. Understanding these communication limits is crucial for gaining insights into game design and player behaviour, making it a significant area of study within the field of game studies.

1.1 Statement of the Problem

Despite the increasing number of studies in board game research, there is a gap in the literature concerning the specific impact of communication limits on gameplay dynamics and player experiences. Communication limits—whether involving restrictions on verbal interaction, timing, or the use of specific types of information—can profoundly shape how players approach a game. These constraints can either enhance the strategic depth and enjoyment of a game or lead to frustration and miscommunication among players. The effects of these communication limits are particularly relevant in the study of both traditional board games and modern digital games, where similar dynamics can be observed.

1.2 Purpose of The Study

The purpose of this study is to examine how communication limits influence player interaction, strategy, and overall gameplay experience in three popular board games: Hanabi, Codenames, and Dixit. By applying Jakobson's communication model and the MDA (Mechanics, Dynamics, Aesthetics) framework, this research seeks to analyse how these constraints affect the ways players communicate, make decisions, and engage with one another. Additionally, the study aims to explore how these findings can inform the design of both physical and digital games, contributing to the broader discourse within game studies.

Chapter 2

Literature Review

This section first explores research in game studies that investigates inter-player communication during gameplay. Then, in the theoretical framework section, the necessary structure is built using relevant theories from both communication studies and game studies.

2.1 Related Work

The intensity and form of communication between players varies across different mediums such as tabletop, console and computer games (Tychsen & Smith, 2008). Therefore, although player communication in board games and digital games are mutually supportive, it may be useful to consider them separately.

In multiplayer digital games, communicative acts, which players use to ensure team coordination and find common ground about events in the game, include many different social interactions such as language-based communication, spatial behaviour or exchanging artifacts (Manninen, 2003). Providing the necessary communication mechanics has a major impact on player performance, especially in games with high player interdependence, interaction with the same objects or complementary roles (Beznoy et al., 2012; Emmerich & Masuch, 2017).

Toups, Dugas et al. (2014) present a framework for communication mechanics in online cooperative multiplayer games under the headings of Environment-Modifying, Automated Communication, Immersive, Expressive, Emergent, and Attention-Focusing. Automatic communication includes ready-made messages that players can use with hotkeys, and although it is a very limited way of communication, it is often used in situations that require quick decision-making (Spyridonis et al., 2018).

While some games offer expressive mechanics, such as virtual gestures, through which players can express their emotions, players can also creatively use attention-grabbing mechanics, such as pinging or annotation, which are included in games for coordination purposes (Alharthi et al., 2018; Leavitt et al., 2016; Wuertz et al., 2017). Toups, Dugas, et al. (2014) refer to mechanics that are used in this way for unintended

communication as emergent communication mechanics and cite the aimless jumping mechanic in games such as Minecraft as an example. A similar example, as Cheung et al. (2012) point out, is when players use the shooting mechanic in first-person shooters to draw the attention of their teammates to a specific location.

Voice communication is predominantly used in first-person shooters, but due to time pressure, players have been found to develop communication patterns such as short sentences, repetitions, and naming different locations in the game (Tang et al., 2012).

Although in-game voice communication channels have been developed to facilitate players' strategic communication, they do not sufficiently meet the social needs of players and they need third-party communication tools (McClelland et al., 2012). (McClelland et al., 2011). When the communication through in-game communication channels is analysed, it is seen that most of the communication is composed of task-oriented communication as well as social-emotional communication (McGee et al., 2011; Peña & Hancock, 2006).

As Haqq et al. (2021) point out, another game in which players prefer to use third-party voice communication tools is Among Us. The reason why players do not find the text-based communication channel offered by the game sufficient is that the dynamics of the game require deceiving other players and text-based communication is not challenging enough for this. This suggests that paralanguage elements such as tone of voice and pauses are necessary not only for social needs but also for gameplay (Manninen & Kujanpää, 2002).

The study conducted by Yuan et al. (2021) during the COVID-19 pandemic period shows that players do not find voice communication sufficient while playing online board games remotely, and that seeing the face and body of the person they are playing with via video chat facilitates cooperation. Maurer and Fuchsberger (2019) suggest that communication mechanics used in digital multiplayer games can also be used in online board games to contribute to communication in such situations. McEwan and Gutwin (2016) approach the issue from a different perspective and state that players playing online chess communicate at many different layers, including clues such as the opponent's experience and personality through moves.

Xu et al. (n.d.) categorize the social interactions that occur during board game play into five groups: interactions arising from activities necessary to maintain or

update the state of the game, reactions to or evaluations of the game after a move, discussions about game strategies before a move, conversations about non-game issues, and comments on the game itself. Negotiations over the moves of players who try to manipulate the game rules can also be added to this list (Hofstetter & Robles, 2019).

Communication-oriented board games are also used in artificial intelligence studies to test different strategies. For example, the Hanabi game requires AI to be able to understand implicit communication due to its cooperative gameplay and imperfect information in the game structure ((Bard et al., 2020; Liang et al., 2019).

Clark et al. (2021) developed a Pictionary-like game in which players use icons to describe given words and tried to develop an artificial intelligence that can understand visual metaphors and similarities, annotations and predict the given word. Kannan et al. (2023), in their study with the Pictionary game, examined the different strategies used by players in the drawing and prediction parts of the game, showed the relationship between them and player profiles, and suggested that artificial intelligence systems that exhibit different playing styles can be developed. Kunda and Rabkina (2020) propose a new AI test, which they call creative titling, using the Dixit game as both inspiration and testbed. The test, which requires generating and understanding creative, interesting or abstract captions for pictures, includes AI research areas such as vision, natural language processing, narrative reasoning and social reasoning.

In addition to studies that use board games in AI research, there are also studies that propose to use AI tools in game design. Zunjani and Olteteanu (2019) propose that the game Codenames can be modeled using associative creativity principles and the difficulty level of the game can be tested using cognitive AI systems. Frans (2021) designed a game called AI Charades, in which players aim to make a language model guess a given word and suggests that language models can serve as innovative tools in game design.

2.2 Theoretical Background

Both communication studies and game studies are crucial for analyzing player interaction in games. Communication studies reveal how messages are transmitted and constrained, while game studies focus on how rules and mechanics shape the player

experience. Together, they provide a deeper understanding of how communication limits impact strategy, social dynamics, and gameplay.

2.2.1 Communication studies. Communication is a broad concept with numerous definitions. Fiske (Fiske & Jenkins, 2011) defines communication as "social interaction through messages" at its core. He categorizes communication studies into two main groups based on their differing perspectives on communication. According to Fiske, the first school is the "process" school, with Shannon and Weaver being its most prominent representatives and founders of communication studies. Their primary focus is on how a message is transmitted through a communication channel between the sender and the receiver. The other school Fiske has mentioned focused on the meaning, how it produced and interpreted, its main research method is semiotics.

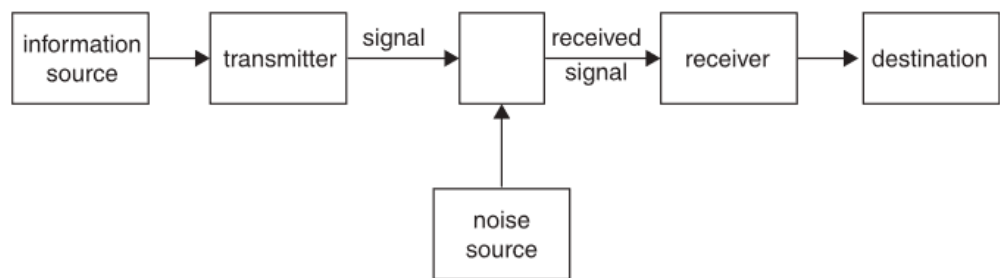


Figure 1. Shannon & Weaver Communication Model (Fiske & Jenkins, 2011)

2.2.1.1 Transmission of the message. One of the most influential concepts introduced by Shannon and Weaver to communication studies is "noise," which refers to the distortions that occur at any level of the communication process, thereby reducing the amount of information in a message (Fiske & Jenkins, 2011). In their book *Rules of Play*, Salen and Zimmerman (2004) discuss how noise can be an element of game design, using examples from games like Charades and Telephone. They argue that the structure of these games inherently creates noise, which increases the level of uncertainty about the information transmitted through the message. According to them, the primary enjoyment in playing these games comes from overcoming this uncertainty to achieve the desired outcomes (Tekinbas & Zimmerman, 2003).

In the process school, "information" has a distinct meaning from its everyday use. It refers to the number of possible choices available to the sender when creating a

message, which in turn determines the amount of uncertainty for the receiver. Utilizing conventions while creating information increases the redundancy of the message, thereby decreasing uncertainty (Fiske & Jenkins, 2011).

Järvinen (2008) describes three types of information in games, information of self, information of others, and the information of system. If the players has all the information about the game system, the game has perfect information, if there are information that players reach through gameplay or available for some players but not the others there are imperfect information.

2.2.2.2 Semiotics. Semiotics is the field those studies how signs created and carries meaning. Chandler mentions three main models in semiotics, Peirce's Model, Saussure's Model, and Jakobson's model. All three models have one thing in common, a sign is "something that stands for something else." Peirce suggests a triangular model which to talk about a sign all three corner of the triangle must exist, a sign vehicle, perceivable material existence of a sign, a referent, the real world object signified by the sign vehicle, and the interpretant, the meaning created in the mind by the sign. Saussure has carried his focus on the signifier (sign vehicle) and signified (interpretant), and he doesn't focus on the material nature of the sign. The third most impactful model is semiotics Chandler mentioned is Jakobson's model, it both combines Saussurean and Peircean views on semiotics and the transmission model of process school (Fiske & Jenkins, 2011).

2.2.2.3 Jakobson's Communication Model. According to Jakobson, there are six constitutive elements of communication. The addresser (sender) sends a message to the addressee (receiver). For this communication to be effective, the message must relate to a context that allows it to be interpreted accordingly and must use a code shared by both the addresser and the addressee. The contact refers to the physical communication channel and the psychological connection between the addresser and the addressee. Additionally, Jakobson identifies six functions of language in communication, each corresponding to one of the constitutive elements. The referential function conveys information about the context, focusing on facts and statements. The emotive function expresses the speaker's emotions and attitudes. The conative function is aimed at influencing the receiver's behavior, often through

commands or requests. The phatic function serves to establish or maintain communication. The metalingual function involves language about language, clarifying the code being used. Lastly, the poetic function emphasizes the aesthetic aspects of language, focusing on the form and style of the message. Together, these functions illustrate the diverse roles that language plays in human communication.

2.2.2 Game studies. Game designers create rules and structures that define a "space of possibility," where players explore potential actions, meanings, and experiences (Tekinbas & Zimmerman, 2003). To understand how communication limits shape player experiences, it's crucial to examine how these limits, as game rules, generate different spaces of possibility and the kinds of experiences that emerge as players navigate them.

2.2.2.1 MDA Framework. In their work, Hunicke, LeBlanc, and Zubek (2004) introduce the MDA framework as a formal approach to game design and research. This framework, which stands for Mechanics, Dynamics, and Aesthetics, provides a systematic method for understanding and designing games by breaking down the player's experience into these three interconnected components. Mechanics refers to the rules, components, and objectives that define the game system. Dynamics represents the behaviors and interactions that emerge as players engage with the game mechanics. Finally, Aesthetics encompasses the emotional responses and experiences elicited by these dynamics. The authors categorize game aesthetics into eight types: Sensation (game as sense-pleasure), Fantasy (game as make-believe), Narrative (game as drama), Challenge (game as obstacle course), Fellowship (game as social framework), Discovery (game as uncharted territory), Expression (game as self-discovery), and Submission (game as pastime). A game doesn't have to engage all these aesthetics; it might only invoke some of them, depending on its design and player engagement.

2.2.2.2 Communication Limits. Communication limits in games are a crucial design element that can significantly impact gameplay by adding layers of strategy, complexity, and uncertainty. According to Engelstein and Shalev (2019), games often impose restrictions on player communication, which can be either absolute—restricting specific pieces of information—or partial, such as limiting verbal exchanges. In cooperative games, these communication limits often serve to increase the game's difficulty, pushing players to convey complex ideas through non-verbal means, as seen in Hanabi, where players must deduce information with minimal communication (Engelstein & Shalev, 2019).

The concept of hidden information is also central to the mechanics of many games. Engelstein and Shalev (2019) highlight that game designers employ various mechanisms to manage the concealment and revelation of information, often through the use of cards, secret roles, or asymmetric information structures.

These communication limits and hidden information mechanics are not merely tools for enhancing difficulty; they also foster unique player interactions and experiences. This approach to game design encourages deeper engagement and can lead to more rewarding gameplay experiences, as players navigate the challenges of communicating and making decisions under constraints.

Chapter 3

Methodology

This study aims to explore how communication mechanics in board games influence player experiences, particularly in games where communication limits are central to gameplay. The study examines three board games—Hanabi, Codenames, and Dixit—due to their unique communication mechanisms, different player configurations, and high ratings on boardgamegeek.com. The methodology includes a formal analysis of game rulebooks, video-recorded play sessions, and thematic analysis of semi-structured interviews conducted using the Situated Recall Method.

3.1 Game Selection

Three board games were selected for this study—Hanabi, Codenames, and Dixit—each utilizing communication as a core game mechanic. The selection was based on three primary criteria: (1) each game has a distinct clue-sharing mechanism central to its gameplay, (2) the games feature different player configurations, allowing for an exploration of how various game dynamics affect gameplay within the constraints of communication limits, and (3) all three games have an average rating above 7.00 and are ranked within the top 1,000 games on boardgamegeek.com.

3.2 Research Design

As suggested by the MDA Framework, all player experiences result from the interaction between game dynamics and mechanics. The rulebooks of the selected games were first analysed using Formal Analysis to understand the structural elements of each game (Lankoski & Björk, 2015). Given the study's focus on how communication limits create different player experiences, understanding the thoughts and emotions evoked during gameplay was crucial. To capture this, the Situated Recall Method was chosen as the primary data collection method. Gameplay sessions were recorded using two phone cameras from different angles. After the sessions, semi-structured interviews were conducted with the participants, using the video recordings to reflect on their actions. The interview data was transcribed and coded using in vivo,

descriptive, and process coding methods in QDA Miner Lite software. A thematic analysis was then conducted to extract the main themes.

3.2.1 Participants. All participants in the study were familiar with each other, with most being long-time friends. Two participants were cousins, and one participant was a close friend of another, though all had previously played board games together. Participants' ages ranged from 29 to 34, and all were male. They were university graduates with professions ranging from engineering to film directing. All participants regularly played board games, with all having played *Dixit* and *Codenames* before, but none having played *Hanabi*.

3.2.2 Play sessions. The play sessions were organized at one of the participants' homes in a comfortable environment, with refreshments provided. Before the sessions, the study's aim was explained, and the rules of all three games were reviewed, with rulebooks available for each game. The optimal length of play sessions and the number of players were determined using data from BoardGameGeek.com. *Hanabi* was played first, as it was new to all participants, thereby increasing cognitive load. Thirty minutes were allocated to playing *Hanabi*, with four players participating. After a 30-minute break, six players played *Codenames* in two teams. Each round was planned to last 15 minutes, with the total game time being 45 minutes. Participants chose to use a timer, setting a limit of 1.5 minutes per turn for the spy to give clues and for the team to choose corresponding words. After another 30-minute break, all six participants played *Dixit* for 30 minutes, with the session concluding when the game ended according to its rules.

3.2.3 Interviews. Following the play sessions, all participants were individually interviewed. Interviews lasted 1.5 hours for those who played *Hanabi* and 1 hour for those who did not, with approximately 30 minutes spent discussing each game. Interviews began with participants watching key moments from the gameplay where clues were given or interpreted, followed by questions to understand the reasoning behind their actions. After reviewing the gameplay moments, a semi-structured interview was conducted to explore the participants' experiences and communication strategies during gameplay. Interviews were recorded using a phone camera and

computer microphone. Three interviews were conducted on the same day as the play sessions, while the other three were conducted the following day due to time constraints. All interviews were transcribed, except for one participant's *Dixit* interview due to technical issues.



Chapter 4

Findings

This research conducted a comprehensive formal and thematic analysis of three board games: **Hanabi**, **Codenames**, and **Dixit**. The analysis focused on how the different use of communication limits in these three games affects **inter-player communication**, as well as the social and gameplay dynamics that emerge during play.

4.1 Formal Analysis

The formal analysis examined the game components, actions, and goals of each game to understand their mechanics and how they facilitate different forms of interaction and strategy.

4.1.1 Hanabi. Hanabi is a cooperative card game designed by Antoine Bauza and first published in 2010. It has innovative communication mechanics, where players must collaborate to create a dazzling fireworks display while avoiding an explosion. A key aspect of the game is that each player holds their cards facing away from themselves, allowing them to see the cards of other players but not their own. Players must rely on limited communication from their teammates to deduce which cards to play in the correct sequence. Hanabi has received critical acclaim, including winning the prestigious Spiel des Jahres award in 2013.

4.1.1.1 Game Components. Hanabi is a card game that uses a limited number of components to create complex game dynamics. The game includes 60 cards in six different colors: blue, white, yellow, green, red, and multicolor. Multicolor cards can be used in different game variants to adjust the difficulty level. For each color, there are three "1" cards, two "2" cards, two "3" cards, two "4" cards, and one "5" card. The varying quantities of cards affect their value during gameplay. Players are dealt five cards each in a 2-3 player game, and four cards each in a 4-5 player game. The remaining cards form a draw pile, and players must place their cards in the center of the table where they are visible to all.

The game also includes eight Blue Clock tokens, which are used to give clues. If players run out of Blue Clock tokens, they must earn more by discarding cards from their hands. Since players cannot see their own cards, if a player has not received any clue about the cards in their hand, they must discard a card at random, potentially risking the loss of a crucial card necessary for success in the game.

In addition, there are four Black Fuse tokens, stacked on top of each other. When a player makes a mistake, one Black Fuse token is removed. If all three Black Fuse tokens are removed, the Explosion token at the bottom is revealed, and the players lose the game. Black Fuse tokens are removed when a player plays an incorrect card, its function in the game is to prevent to play random cards to succeed in the game.

4.1.1.2 Actions. On their turn, players must choose one action from three possible options: giving a clue, playing a card, or discarding a card. Players cannot skip their turn. If a player has no blue clock tokens and lacks information about their hand, they must either play or discard a card randomly, leading to some of the riskiest moments in the game. When giving a clue, players may only provide information about the number or color of the cards in another player's hand, such as saying, "These cards are 4!" or "These cards are blue!" They cannot give more than one clue per turn, which adds strategic depth by requiring players to decide what information to share and when to share it. Players are also free to choose which teammate to give the clue to, adding another layer of strategy.

While players cannot see their own hands, they can see the cards in other players' hands and in the discard pile at any time. Thus, the only hidden information from players is the identity of the cards in their own hand and the cards in the draw pile. Players can deduce the identity of their own cards using available information and probability, considering the distribution of the cards. The rulebook also suggests that after receiving a clue, a player may rearrange their cards, highlighting that memorizing given clues is an integral part of gameplay.

The level of communication is left to the players' discretion according to the rulebook. It states that in strict gameplay, players may only communicate while giving clues and cannot say anything beyond the clue. However, the rules also allow players to adjust the level of communication according to their own preferences.

4.1.1.3 Goals. The short-term goal for players during gameplay is to find the best clue that will allow a card to be played in the correct sequence. The mid-term goal is to complete a sequence of cards in a color up to the number 5. The long-term goal is to finish all color sequences and achieve the maximum score of 25 points. The only fail condition in the game is making three mistakes, leading to an explosion. Otherwise, players can earn a score based on the highest value card in each completed color sequence. This scoring mechanism determines the strategic value of the cards during gameplay, as playing a "5" yields a higher score than playing a "3." After the score is determined, players can consult the score scale in the rulebook, which consists of six scoring groups ranging from 5 to 25 points, each corresponding to different overall impressions. This mechanism may encourage players to compete against their previous scores in subsequent games.

4.1.2 Codenames. *Codenames* is a word-based party game designed by Vlaada Chvátil and first published in 2015. The game quickly gained popularity and was awarded the prestigious Spiel des Jahres in 2016. *Codenames* is unique in its combination of cooperative and competitive gameplay. While players must collaborate within their team to succeed, they simultaneously compete against the opposing team. Each team designates one player as the "spymaster," whose role is to give clues to their teammates, known as "field operatives." These clues are designed to help the field operatives identify their team's agents hidden among a grid of codenames. The game requires a minimum of four players, as there must be at least one spymaster and one field operative on each team. Throughout the game, spymasters carefully craft their clues to lead their team to victory by uncovering the correct agents while avoiding those of the opposing team.

4.1.2.1 Game Components. Each game features a grid of 25 words placed on the table in a 5x5 layout. Both spymasters use the same key card, which indicates which words belong to the blue team, which belong to the red team, which words are innocent bystanders, and which word represents the assassin. If a field operative selects the word associated with the assassin, their team immediately loses the game. Thus, spymasters must be cautious not to give clues that could lead their team to select the assassin's word. The game includes innocent bystander cards, one assassin card, eight

blue agent cards, eight red agent cards, and one double agent card (with two sides). The team whose color is shown on the edge of the key card begins the game and has nine words to guess, while the other team has only eight. After a field operative selects a word, the identity of that card is revealed, and the corresponding agent card is placed over it. A sand timer is not provided in the Codenames box, but the rulebook suggests an app for time tracking. However, keeping time is optional and left to the players' preferences.

4.1.2.2 Actions. Each turn, a team's spymaster provides a one-word clue, and the field operatives try to identify the codenames related to that clue by touching the words they believe are connected. The spymasters and field operatives are each limited to specific actions with certain restrictions. Spymasters may only say one word along with the number of codenames related to that word, and they are not allowed to give any additional hints, such as non-verbal clues or comments. Field operatives may continue guessing until they have either found all the correct codenames or selected an incorrect card, at which point the turn passes to the other team. If they find a rival team's card, the rival team gains an advantage. During their turn, field operatives must make at least one guess, but they can choose to end their turn after their first attempt if they are uncertain about the remaining codenames. For instance, if the spymaster says "apple, 3," the field operatives can make two correct guesses and then decide to end their turn if they are unsure about the third codename. If the field operatives correctly identify all the codenames, they earn a bonus that allows them to make an additional guess, potentially identifying a previously hinted codename. The rulebook also mentions two expert clues that spymasters may choose to use: one is the "zero clue," which indicates that no words are related to the clue (e.g., "cherry, 0"), and the other is the "unlimited clue," which allows field operatives to make unlimited guesses. This might be useful if their team is behind and the game is nearing its end. The Codenames rulebook provides a detailed section on allowable clues. While the clue's meaning is expected to relate to the codenames, there are flexible rules that permit the use of homonyms, acronyms, compound words, or proper nouns, depending on the players' preferences.

4.1.2.3 Goals. The game ends when a team finds all the correct codenames belonging to their team or when a team selects the assassin word and loses. The short-term goal of the game is to identify as many correct words as possible in one turn while avoiding the assassin word. The long-term goal is to identify all the correct words before the opposing team, which creates the competitive element in the game.

4.1.3 Dixit. Dixit is a storytelling card game designed by Jean-Louis Roubira and first published in 2008. The game is known for its beautiful, surreal illustrations and its focus on creative expression and interpretation. The game's combination of simple mechanics and deep, evocative imagery has made it a favorite among both casual and serious gamers.

4.1.3.1 Game Components. In Dixit, players keep track of their scores on a scoreboard using rabbit-shaped meeples. The game includes 84 distinct cards with unique illustrations, and each player is dealt six cards at the beginning of the game. Players also receive voting tokens equal to the number of players. When a player becomes the storyteller, they provide a clue, and all players then play a card face down on the table. The storyteller then shuffles the cards, places them face up in a line, and assigns a number to each card. Players use their voting tokens to vote for the card they believe matches the storyteller's clue. After the storyteller reveals which card was theirs, the other players declare their cards and receive corresponding points, moving their rabbit meeples on the scoreboard accordingly. The turn then passes to the next player in a clockwise direction.

4.1.3.2 Actions. On their turn, the storyteller selects a card from their hand and places it face down on the table. They then provide a clue to describe the image on the card without any limitations. The other players choose a card from their hand that they think fits the given clue and place it face down on the table. The storyteller shuffles the cards and reveals them face up. All players, except the storyteller, then try to identify which card belongs to the storyteller. If all players correctly identify the storyteller's card, the storyteller does not earn any points, but all other players earn 2 points. If no players identify the storyteller's card, the storyteller still does not earn any points, but all other players earn 2 points. In any other scenario—where at least one

player identifies the storyteller's card, but not all do—the storyteller and the players who correctly identified the card each earn 3 points. Players also earn 1 additional point for each player they manage to mislead with their played card. At the end of each turn, all players draw a new card, maintaining a hand of six cards throughout the game. Each turn, a different player becomes the storyteller, and the turn structure remains consistent. After the last card is drawn from the deck, one final round is played before the game ends.

4.1.3.3 Goals. In Dixit, the long-term goal is to win the game by earning the highest score. The game's short-term goals are shaped by its scoring system. For the storyteller, earning a higher score involves providing a clue that is ambiguous enough to prevent all players from identifying their card, but not so ambiguous that no one can. Thus, the short-term goal for the storyteller is to find the optimal clue that balances these conditions. While Dixit does not impose strict communication limits, it achieves a similar effect through its scoring system. For the players who are not in the storyteller role, there are two short-term goals in each turn: first, to play a card that might mislead other players, which requires finding a convincing connection between the given clue and the cards in their hand; and second, to identify the storyteller's card among all the played cards. While all the cards will likely relate to the given clue, the goal is not merely to find the most related card but to deduce which card the storyteller might have selected based on their interpretation of the clue.

4.2 Thematic Analysis

The thematic analysis explored how these games influence player communication, decision-making, and emotional experience. It highlighted how the rules of communication, personal and cultural influences, and the uncertainty inherent in gameplay shape players' strategies and interactions. The study also delved into the social dynamics that emerge during gameplay, focusing on how these games foster feelings of closeness or tension among players.

4.2.1 Interpretation and personal context in communication. The theme "Interpretation and Personal Context in Communication" highlights how players' communication during gameplay is deeply influenced by their personal relationships, shared experiences, and understanding of each other's personalities. This dynamic is evident in how players form and interpret clues, with the effectiveness and enjoyment of the game often depending on the alignment of these personal contexts.

4.2.1.1 Interpretation of Communication. Communication limits create unique methods of interaction during gameplay, allowing players to achieve specific outcomes. For instance, in Hanabi, players engage in dialogue and share their inferences about their own hands, which, according to the game's rulebook, is subject to the players' preferences. Some of these shared inferences also offer additional information about other players' hands, as Participant 1, who makes these inferences, can also see the other players' hands while making them. This situation resulted in three distinct perspectives among the participants.

Participant 1 acknowledged that these inferences might unintentionally provide extra information. However, they argued that limiting this type of communication is challenging while establishing dialogue during gameplay. Moreover, they believed that playing the game without dialogue could reduce the enjoyment, as it removes the element of idea exchange among players. In contrast, Participant 6 contended that this type of communication should be considered a rule violation, as it offers additional information without using any clue tokens. On the other hand, Participant 4 defended the use of this communication, arguing that increasing the amount of information reduces the randomness of moves in the game, stating that "it should be that way; otherwise, the game could become much more random. This way, players have the opportunity to strategize."

While it is difficult to determine the correct approach to resolving this conflict based on a single play session, it can be suggested that the flexibility in communication rules can lead to disagreements among players.

Evocation was frequently highlighted by participants during both the clue formation and interpretation processes in the games Dixit and Codenames. Participants commonly relied on connotations to craft clues for other players. In Codenames, focusing solely on the denotations of the words in play posed a risk of misleading

teammates, potentially leading them to select the assassin's word or the opposing team's word. As a result, all participants mentioned that before giving a clue, they would check the connotations of their chosen word to ensure it did not relate to any of the assassin's words.

Participants emphasized that the game state influenced how far-reaching their clues' connotations would be. For example, at the beginning of a game session, they would attempt to find clues for fewer words. However, toward the end of the session, if the opposing team was ahead, they tended to give clues with broader connotations to identify more words, despite the increased risk. Another reason for providing clues with extensive connotations was the desire to get ahead of the other team, thereby gaining a psychological advantage. Additionally, some participants mentioned that finding clues with many connotations was simply more enjoyable, as it allowed for connections between their team's codenames. For instance, Participant 1 recalled a memorable experience while playing Codenames: "I said something like 'Aragog, 6,' and they actually guessed it correctly. That was really enjoyable. It's fun when it works out like that."

In Dixit, participants particularly focused on avoiding denotative clues. Participant 6 stated, "But the most stressful part is accidentally saying something too obvious. Not being able to say something that's vague enough or interesting enough..." Giving clues with more connotations was seen as important, not only for success in the game but also for shaping how the player would be perceived by others in the group. Participant 2 noted that considering vague clues was a factor during clue interpretation, which sometimes led to misinterpretation. For example, when the given clue was too obvious in relation to the storyteller's card, Participant 2 chose other cards, thinking, "This is too obvious; it will mislead the person. It can't be that; everyone knows that one." This mindset not only influenced clue interpretation but also impacted the cards they played in Dixit. Participant 2 often selected more ambiguous cards, which in one case led to no one guessing their card when they were the storyteller.

4.1.1.2 Personal and Cultural Influences on Interpretation. All participants noted that they considered the personalities, likes, dislikes, shared experiences, and recent discussions of other players during both the clue formation and interpretation processes. In Hanabi, unlike the other two games, having a shared gameplay history was deemed more important than personal common ground. A shared gameplay history helps players quickly determine which roles to take during gameplay. Hanabi's flexible role assignment contrasts with the more rigid roles in Dixit and Codenames. Participants also mentioned that both previous shared gameplay experiences and the previous moves of other players in the same game session influenced their understanding of others' playstyles during the clue formation and interpretation processes.

Most participants said that personal common ground and shared knowledge with other players were important considerations while playing Codenames. Participant 3 mentioned that considering other players' personalities, shared experiences, and knowledge might be a good strategy for winning, but they played the game more for fun rather than to win. Therefore, they often provided clues guided by personal feelings and associations. Participant 5, while playing Dixit, focused on giving clues "that would match the naivety of the card" as their primary concern and did not specifically consider what other players might understand from the clue. They also mentioned that winning in Dixit was not as important as winning in Codenames.

While most participants frequently used shared experiences during gameplay, they also expressed that using information known only to a small number of players seemed unfair. Participant 2 distinguished between using inside jokes and personal common ground, stating, "I remember sometimes two people would use an inside joke between them, which isn't right, of course. But sometimes I think, 'This person knows me well enough to understand what I mean here.' However, I don't use a contextual situation that's personal to that individual." Participant 1 emphasized that using inside jokes while playing with players who are not part of the friend group felt inappropriate: "For example, if there's someone at the table I don't know, I never use inside info to explain something because it feels rude to me. But if people are doing that, I assume they aren't considering such things."

4.2.2 Decision-making under uncertainty. Decision-making under uncertainty in the analyzed games, *Hanabi*, *Codenames*, and *Dixit*, revolves around players navigating complex scenarios where they must make choices based on incomplete or ambiguous information. This uncertainty challenges players to develop strategies that minimize risk while maximizing potential rewards.

4.2.2.1 Navigating Uncertainty. When participants couldn't find a clear connection between the given clue and the intended game element, they resorted to eliminating irrelevant cards in *Dixit* and irrelevant words in *Codenames*. In *Codenames*, when the number of relevant codenames exceeded the number given by the spymaster, they tried to identify the correct word by considering what words the spymaster might have used instead. For example, in one instance, Participant 1 reasoned, "If the codenames were school and uniform, they wouldn't say school report; they would say student." Participants frequently mentioned that the randomness of the codenames sometimes led to an imbalance in the challenge for the two teams. If no words were related to the assassin's word, the game session became easier for that team.

In *Hanabi*, participants were most challenged by uncertainty when a player knew nothing about their hand and had no clue tokens. In these situations, players had to play or discard random cards from their hand, which was where hidden information created the greatest challenge. This challenge arose from players quickly spending all the clue tokens at the beginning of the game session. This situation created a play pattern where each player had to consider whether the other players had the necessary information to make the correct move when their turn came.

In *Dixit*, participants frequently mentioned a design issue that unintentionally reduced uncertainty during gameplay. When describing situations where they played cards unrelated to the storyteller's clue, participants often mentioned that they didn't have any relevant cards in their hand. Participant 6 described a situation like this: "I played this because I had no other cards. It didn't mean anything," despite having six cards in their hand. Participant 5 mentioned that in such situations, they would play a card they didn't dislike and that didn't have many connotations. Participant 2 found *Dixit*'s visuals "too generic," as some cards didn't lend themselves to much

interpretation. Participant 5 echoed this sentiment, noting that some cards led to more interpretations than others.

The design of game components also created distractions and increased uncertainty. All participants complained about the Hanabi cards, finding the colours difficult to distinguish. Codenames was criticized by the participants for the design of its codename cards, as they were difficult to see for some players around the table. Additionally, the mismatch between the square shapes representing codenames on the key card and the rectangular codenames on the table could cause confusion for spymasters. In Dixit, although there were fewer of these issues, small details on some visual cards could lead to different interpretations and be missed by players who didn't look closely.

4.2.2.2 Strategic Thinking and Risk Management. In Hanabi, participants often chose to give clues to the player who would play immediately after them to minimize risk. However, many participants considered the most successful moments in the game to be when they played cards sequentially by giving clues to other players in order. They achieved this by having Player 1 give a clue to Player 3, Player 2 give a clue to Player 4, and Player 4 understand that they were trying to achieve sequential play. Accomplishing this was challenging and required creating in-group conventions about the meanings of certain moves without talking. However, most players believed that Hanabi had a limited number of optimal strategies, and once they found these, they tended to use the same strategy in each play session. For Participant 1, the reason behind repeatedly using the same strategies in Hanabi was the game's important level of punishment. They described failing to finish a colour sequence because of losing an important card as a significant punishment that increased tension in the game.

For Codenames, participants mostly said that playing the game in the spymaster role was more fun. The most enjoyable challenge was trying to find a word that could refer to as many codenames as possible. On the other hand, the biggest challenge for the spymaster was giving a clue that did not connote the assassin's codenames. Participant 5 shared a strategy: "When you need to hint at something that might be associated with the bomb, you save it for the end." They also mentioned that since all the related codenames were found at the beginning of the game, irrelevant codenames might remain at the end, increasing the challenge.

4.2.3 Social interaction and emotional experience. The theme of "Social Interaction and Emotional Experience" focuses on how players perceive competitive and cooperative game settings differently and how communication limits evoke a range of emotions, both positive and negative.

4.2.3.1 Social Dynamics in Gameplay. When describing their experiences with Hanabi, participants often used terms like "help" and "need" to characterize their interdependencies within the game. The unique mechanic of not knowing one's own hand while being able to see others' hands creates a distinct dynamic. Participant 2 reflected on this, stating, "We don't know our own hand, and you're trying to discover and understand it, but I didn't actually focus on that too much. It's like... well, I thought, this isn't my task; my area of play is to help those who can't see their own hands. Somewhere in there, I felt as if my own hand wasn't really mine, but that the cards held by the others were like my own hand." Participant 4 added that this interdependency "... creates the necessary foundation to feel like part of a group."

In discussing Codenames, Participant 2 described it as a more cooperative than competitive game, explaining, "You try to understand what your teammate means. Then you also debate with the other person you're with, deciding what to choose. So yes, cooperation is more important and more dominant." Participant 6 supported this view, stating, "I think it's more about the co-op part. Because if we do well ourselves, we win the game anyway. I don't pay much attention to the opponent. When we focus on doing well ourselves, we usually win." In contrast, Participant 1 perceived Codenames as being more competitive than cooperative, reasoning that the presence of a competitor naturally creates competitiveness. They added that even within a team, there's a drive to perform better than one's teammates: "Because, in reality, you're trying to play better than your own teammates."

Another topic that participants found challenging to accept during gameplay was the use of facial expressions or gestures by other players. Most participants stated that they intentionally avoided looking at the spymaster's face to prevent receiving additional, unintended clues. However, Participant 5 offered a different perspective, suggesting that the communication limits in the game are beneficial because they encourage players to read nonverbal cues, which adds to the fun of the game.

Participant 6 concurred, stating, "Not being able to speak? I think it's nice because you try to pay attention to other things, like their reactions and stuff."

4.2.3.2 Emotional and Creative Expression. Most participants did not view Hanabi as a game that fosters creative thinking. Participant 1 explained, "... we can't really create many innovative strategies in this game. You're constantly focused on avoiding mistakes. In real life, creativity doesn't emerge when you're solely focused on not making mistakes."

In contrast, Codenames and Dixit were seen as more conducive to creativity. Participant 4 described Codenames as a game that "really frees up your creativity. Since we try to express different words and concepts through their common points, it encourages that creative spark within us. In this sense, I think it's both fun and a great game." Dixit was identified as the game with the most potential for creative thinking. However, familiarity with the cards over time may reduce the number of connotations they evoke. Participant 5 noted, "Yes, it would be better if we didn't know any of the cards. You know, with those more artistic illustrations and such. They trigger your imagination more. It's fun to evoke something from them."

All participants agreed that Hanabi fosters a feeling of closeness through player interdependency, while Codenames and Dixit build closeness through shared personal experiences and attempting to guess what other players are thinking. Participant 6 stated, "Because I know people's personalities, I can better predict what they might say. It creates a sense of closeness, like you are building a connection with your friends. Or when they say something that you might have thought of, it makes you feel like, 'They've thought about what I would think.'" They also mentioned that this closeness is not exclusive to friends, as playing Dixit with strangers can also provide insights into their personalities.

Social games can also evoke negative emotions. Tension among team members due to mistakes may lead to pressure on the players. Participant 1 recalled an argument with Participant 6 during the Codenames session: "It's like that moment when 'participant 6' and I argued when I was the agent. If you say something wrong and cause the team to lose, the tension goes beyond just expressing yourself—it could make you withdraw even more. That is why you might end up saying something like 'Frame, 1' when you are trying to represent glasses. You just keep it safe and move

on." Furthermore, Participant 1 added that playing with unfamiliar people might not always be enjoyable, as some players may become more hesitant in their gameplay.



Chapter 5

Discussions and Conclusions

5.1 Discussions

Communication limits in gameplay are evaluated through Jakobson's communication model and the MDA framework, illustrating how these constraints shape decision-making, collaboration, and social interaction in games like Hanabi, Codenames, and Dixit. In Hanabi, strict communication limits enhance teamwork, while in Codenames and Dixit, more flexible communication fosters creativity through shared cultural and personal contexts. Players' emotional experiences—ranging from tension to satisfaction—are closely tied to how effectively they navigate these limits, ultimately influencing the social dynamics and strategic complexity of each game.

5.1.1 Communication limits and their role in gameplay. Using Jakobson's communication model, the analysis examines how the sender (player giving clues) and receiver (player interpreting clues) operate within the constraints set by the game's rules, which act as a code that shapes communication. In Hanabi, these strict communication limits—where players are unable to see their own cards and must rely on clues from others—highlight the significance of non-verbal cues and inferred meanings. Jakobson's conative function (influencing others' behavior) plays a critical role as players strive to guide their teammates to make correct moves without triggering the explosion. These constraints, while challenging, create a distinct form of gameplay that requires high levels of coordination and strategic thinking. This aligns with the MDA framework, where the rules governing communication directly impact players' strategies and interactions, leading to an Aesthetic of Fellowship and Challenge.

In games like Codenames and Dixit, the flexibility in communication—where players can utilize connotations and cultural references—introduces additional complexity. Jakobson's referential function is at play throughout the clue-giving and interpretation processes, as interpreting codenames within different contexts can lead to penalties, such as selecting the assassin word in Codenames. The challenge of finding the most accurate clue that links various words through common contexts

fosters the Aesthetics of Discovery and Challenge. In Dixit, the open-ended nature of clues enhances creativity, with players leveraging personal and cultural knowledge to convey nuanced meanings. This variability in communication contributes to an Aesthetic experience of Discovery and Expression, where players derive satisfaction from successfully interpreting or misleading others with cleverly chosen clues.

5.1.2 Decision-making under uncertainty. The thematic analysis highlights how decision-making in these games is shaped by uncertainty, a key aspect of Jakobson's referential function (context). In Hanabi, uncertainty is intensified by the hidden information mechanic, where players must infer the contents of their own hands based on limited and indirect information. This often leads to critical decision points, where the risk of making an incorrect move can have significant consequences, reflecting the Dynamics of risk management within the MDA framework.

5.1.3 Personal and cultural influences on gameplay. Jakobson's phatic function (establishing and maintaining communication) is evident in how players incorporate shared cultural references and personal knowledge in both clue-giving and interpretation. The analysis reveals that in games like Codenames and Dixit, players frequently draw on shared experiences and cultural knowledge to enhance communication, which in turn fosters a sense of closeness and camaraderie. This aligns with the Aesthetic of Fellowship, where the joy of connecting on a deeper level with fellow players enriches the overall gameplay experience.

However, the reliance on personal and cultural references also introduces potential imbalances, as not all players may share the same background or experiences. This can lead to moments of exclusion or misunderstanding, underscoring the tension between the inclusive and exclusive aspects of communication in games. Consequently, the Dynamics of gameplay are influenced by these personal and cultural factors, which can either strengthen or weaken team cohesion depending on how they are navigated.

5.1.4 Social interaction and emotional experience. The analysis of social dynamics within these games uncovers the significant role emotions play in shaping the gameplay experience. Jakobson's emotive function (expressing the sender's emotions) is particularly relevant in games where players' decisions are influenced by their emotional state, such as the pressure to avoid mistakes in Hanabi or the anxiety of giving clues in Codenames. The Dynamics of social interaction in these games are often marked by cooperation and competition, with players experiencing a range of emotions from joy and satisfaction to frustration and tension.

The Aesthetic experience of these games is deeply intertwined with these emotional dynamics. In Hanabi, the interdependence among players fosters a strong sense of group cohesion, while in Codenames and Dixit, the interplay between cooperation and competition adds complexity to the social experience. These games offer a sense of accomplishment when players successfully navigate the social and emotional challenges, but they can also provoke negative emotions when communication falters or when players feel excluded or misunderstood.

5.2 Conclusion

This study has explored the complex dynamics of communication in board games like Hanabi, Codenames, and Dixit through the frameworks of Jakobson's communication model and the MDA framework. Each game, with its distinct mechanics, presents unique challenges related to communication, uncertainty, and social interaction. In Hanabi, the restrictive communication mechanics emphasize non-verbal cues and shared inferences, underscoring the conative function of guiding team behavior. Conversely, Codenames and Dixit offer more flexible communication, encouraging creativity and personal expression through connotations and cultural references. These dynamics culminate in a rich aesthetic experience where players' emotional responses, tension, and discoveries are intricately linked to their strategic decisions and social interactions.

The analysis also highlighted the dual nature of social dynamics within these games. While shared experiences and cultural references can enhance communication and foster camaraderie among players, they also have the potential to introduce imbalances or feelings of exclusion, particularly when players do not share the same background. Additionally, the emotional intensity associated with decision-making

under uncertainty, especially in competitive environments, can either amplify the sense of achievement or lead to frustration and tension.

5.3 Limitations & Recommendations for Future Research

The study's findings are limited by several factors that may affect the generalizability of the results. First, the participants were all male, of similar ages, and had a shared background of frequently playing board games together. This homogeneity limits the applicability of the findings, as factors like gender, cultural diversity, or differing levels of familiarity could significantly alter communication dynamics and gameplay strategies. Additionally, the play sessions were restricted to a set amount of time, which may not fully capture the evolution of strategies or communication patterns that develop over longer or repeated gameplay. Players may adapt and refine their communication tactics with more time, which the study did not explore in depth. Moreover, the flexibility in interpreting communication rules—especially in games like *Hanabi*—allowed participants to adjust their communication styles during gameplay. While this flexibility is an inherent part of the game design, it introduces variability that could affect the consistency of the data on communication limits and their overall impact on gameplay dynamics. These limitations suggest that further studies with more diverse participant groups and longer play sessions are needed to provide a more comprehensive understanding of communication limits in games.

The thesis highlights how communication limits as a game mechanic shape different player experiences and game aesthetics, such as Challenge, Fellowship, Expression, and Discovery. Future research could explore how different types of communication limits influence these aesthetics across diverse player groups. For example, investigating asymmetric communication limits (where one player has more information or greater communication freedom) might reveal whether this intensifies the Challenge or alters the dynamics of Fellowship. Longitudinal studies could track how these aesthetics evolve over time as players become more skilled at navigating communication limits. Insights from such research could help game designers create mechanics that remain engaging across multiple play sessions.

Communication limits also evoke a variety of emotions, such as tension, frustration, joy, and satisfaction, as highlighted in the thesis. Future studies could

investigate how these emotional responses vary depending on the gameplay dynamics (e.g., competitive vs. cooperative) or player experience (novices vs. experts). For example, researchers might explore whether communication limits foster positive emotions, like collaboration and trust, more effectively in cooperative settings like *Hanabi*, compared to competitive ones like *Codenames*.

The thesis notes that shared history and personal knowledge impact communication in games. Future research could explore how personalized communication limits—adjusted based on the familiarity or relationships between players—might enhance player experiences. For example, games could tailor the difficulty of clues or communication restrictions based on how well players know each other, creating personalized challenges that adapt to the group's skill level or prior experience.

While *Codenames*, *Hanabi*, and *Dixit* have been explored in AI research, this thesis introduces new challenges and insights that could deepen AI's understanding of human gameplay dynamics. One key area is the role of **trust** between players, especially in cooperative games like *Hanabi*, where successful play depends on interpreting clues under strict communication limits. The findings also highlight the importance of recognizing the **emotional states** of cluegivers, such as **stress**, **performance anxiety**, or even the desire to evoke laughter, all of which shape how clues are given and interpreted. Additionally, the thesis underscores the significance of shared personal and cultural backgrounds in influencing how clues are formed and decoded, suggesting AI systems need to adapt to these interpersonal contexts. The balance between cooperation and competition in games like *Codenames* shows that AI could benefit from adjusting strategies based on the social context of the game. Moreover, the thesis points out how **risk** impacts decision-making, particularly when players form clues under pressure, and how limited game components shape communication, offering valuable insights into how AI can simulate human-like responses under such constraints. These findings open avenues for AI research to explore more complex, socially aware, and emotionally responsive game interactions.

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