

For a Better Social Experience:

Furniture Designed as a Medium for New Social Dialogue Between Shy and Outgoing People

by

Pengjia Chen

A dissertation submitted to
Department of Industrial Design, Xi'an Jiaotong-Liverpool University
in partial fulfillment of the requirements for the degree of

MASTER OF DESIGN
IN
INDUSTRIAL DESIGN

December 2023

Abstract

Shyness, as a personality trait as opposed to outgoing, is also an emotionally common phenomenon that can be seen as a series of avoidance behaviours in social situations, such as less eye contact, blushing and sweating, trembling voice, and being silent due to nervousness. However, due to historical and cultural reasons, people with open personalities are more likely to be recognised and respected by society, whereas shyness is often labeled as negative, timid, and avoidant. Moreover, social interaction at this stage is based on a simple perception-interaction sequence, where people quickly guess the characteristics of another person based on a one-sided first impression (behaviour, look, appearance, etc.) when they meet for the first time, and then override the perceived impression to other qualities of the same person. At the same time, under the influence of prevailing "social perceptions", shy people's introverted behaviour can be misinterpreted as rude and self-centred, leading to the marginalization of shy groups in social environments as unfriendly, resulting in an unequal social status and experience.

This study aims to explore a new form of dialogue in social interaction that can enhance the two-way social experience by influencing the perception and understanding of shy people by outgoing people. Unlike the traditional dialogue model of verbal communication between people, the ideal new dialogue is more about exploring the possibility of multi-interactive mechanisms of objects as a medium of communication to help others understand shy people better and to explore the potential of human, object and behaviour (shyness) relationships. In order to achieve this goal, the project will extract representative furniture and small objects from social scenes and deconstruct them morphologically, to discover the embodiment of "shy interaction" through the formation of a series of objects that do not conform to the "habit". At the same time, colour, texture, and other factors are also taken into account in the process of perceiving shyness, so that outgoing people can shift the object of their perceived shyness from people to objects, breaking the social cycle and gradually establishing new modes of dialogue.

In terms of result, this project reimagines three common social furniture types (chairs, tables, floor lamps), deconstructing and concretizing perceived "shy behaviors" to evoke an unconventional sense of strangeness. The alterations, while normal for the shy demographic, challenge prevailing

perceptions by disrupting established social interaction habits. The series aims to prompt reflection on inherent differences and inequalities in social interactions. The overarching vision is to challenge stereotypes and encourage a reconsideration of interpersonal communication and understanding.

The whole project is based on Reflective Practice, favoring multiple tests and practices during the design process, and generating improved prototypes and understandings based on the resulting data and new phenomena. The testing process is qualitative and quantitative, which includes questionnaires, user observation, interviews, and recordings to provide multiple perspectives for the design process. This project hopes not only to enhance the social experience for both groups of people, but also make the public reflect on the fact that there are invisible prejudices and misunderstandings about shyness, then promote the correct perception of shyness in the society. In addition, this study combines design with sociology, psychology, and other related disciplines in terms of theoretical foundations and principles, and the final design and related test results can be used for reference and improvement by practitioners in related fields.

Declaration

I hereby certify that this report constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

I declare that the dissertation describes original work that has not previously been presented for the award of any other degree of any institution.

Pengjia Chen

Acknowledgement

I would like to extend my special thanks to my supervisor, Richard Appleby, for his patient guidance, which has deepened my understanding of the relationship between individuals and objects, allowing me to approach design from a unique perspective. Additionally, I am grateful to my important tutor during my postgraduate studies, Vicente Esteban, whose creative suggestions have been invaluable to me. I express my deepest gratitude to all my classmates and my parents, whose affirmation has filled me with confidence. I also thank all the participants in this research, who have made significant contributions to this design study from their busy schedules.

Lastly, I want to express my gratitude to my long-time companion, plush toy doggy, for serving as the spiritual support behind the completion of this project.

Contents

Chapter 1. Introduction

1.1 Background

- 1.1.1 Shyness
- 1.1.2 Disadvantages & Advantages
- 1.1.3 Social Environment & Social Perception
- 1.1.4 Perception in Unfamiliar Situations & Halo effect

1.2 Problem Statements

- 1.2.1 Stigmatized Shyness
- 1.2.2 Unequal Social Relationships
- 1.2.3 Reduced Social Experience

1.3 Research Questions

- 1.3.1 Is it possible to build a new dialogues that can improve two-way social experiences between shy people & outgoing people?
- 1.3.2 Is it possible to ensure outgoing people understand shy people more effectively?
- 1.3.3 Is it possible to influence outgoing people's perception of shy people?

1.4 Design Objects & Aims

1.5 Significance of Research & Design

Chapter 2. Literature Review

2.1 Definition & Assessment of Shy People

2.2 The "Pathologization" and "Treatment" of Shyness

2.3 Alternative Approaches

2.4 Conclusion

Chapter 3. Methodology & Previous Tests

3.1 Reflective Practice

3.2 Preparation: Offline Questionnaire Survey

3.3 Test 1: Perception of Behavior

- 3.3.1 Observation: Topics Choose
- 3.3.2 Results & Discussion of Observation
- 3.3.3 Interview: Perceived Behaviors
- 3.3.4 Results & Discussion of Interview

3.4 Test 2: Difference of Understanding

3.4.1 Workshop 1: Describing & Matching

3.4.2 Results & Discussion of Workshop 1

3.4.3 Workshop 2: Storytelling

3.4.4 Results & Discussion of Workshop 2

3.4.5 Workshop 3: Feeling Expressing

3.4.6 Results & Discussion of Workshop 3

3.5 Summary & Design Opportunity

Chapter 4. Design Process

4.1 Selection of Product Type

4.1.1 Reason of Choosing Set of Furniture

4.1.2 Furniture from Social Scenario

4.2 Relationship between Furniture & Shy Behavior

4.2.1 Reason of Combining Furniture & Shy Behavior

4.2.2 Correspondence between Furniture & Shy Behavior

4.3 Inspiration Collection

4.4 Design Part 1: Chair Design

4.4.1 Concept Generation

4.4.2 User Test, Problem & Finding

4.5 Design Part 2: Table Design

4.5.1 Concept Generation

4.5.2 User Test, Problem & Finding

4.6 Design Part 3: Lamp Design

4.6.1 Concept Generation

4.6.2 User Test, Problem & Finding

4.7 Final Outcomes

4.7.1 Final Concepts

4.7.2 CMF Study

4.7.3 Final Rendering

4.7.4 Final Models

4.7.5 Exhibition

Chapter 5. Conclusion & Reflection

5.1 Conclusion

5.2 Reflection

5.3 Further Direction

Chapter 1. Introduction

1.1 Background

1.1.1 Shyness

Shyness is a common emotional phenomenon and although it is a frequently used word, it has different interpretations and definitions. Shyness is commonly defined as "a kind of fear or discomfort caused by others, especially in new situations or in the stranger"(Heitz, 2019). Also with reference to psychological analysis, it is a personality trait that is overly self-conscious and concerned with how subjects are perceived by themselves and others. In fact, everyone has experienced shyness, illustrated by Carducci (2013) reporting that 40% of adults and 46% of adolescents in the US consider themselves to be shy, while only 5% claim to have never been shy. Similarly, only a small proportion of people in other cultures report that they have never felt shy (Philip, 1977). The transient shyness that most people only experience in certain situations or conversations is called "situational shyness", as a natural environmental response. Whilst the small percentage of people who are shy in almost all situations are referred to as having "Chronic shyness", which is often influenced by an individual's genes and upbringing (Lynne, 2010).

According to Henderson and Henderson and Zimbardo (2001), the manifestation of shyness occurs at various levels varying from cognitive level (e.g., excessive negative evaluation of self), affective level (e.g., feelings of anxiety), physiological level (e.g., arousal of sympathetic nervous system) to behavioral level (e.g., failure to respond appropriately), and may also be caused by various other situational cues (Fig. 1.1.1-1). Different levels of shyness depends, on the environment people find themselves, influenced by their personalities and experiences.

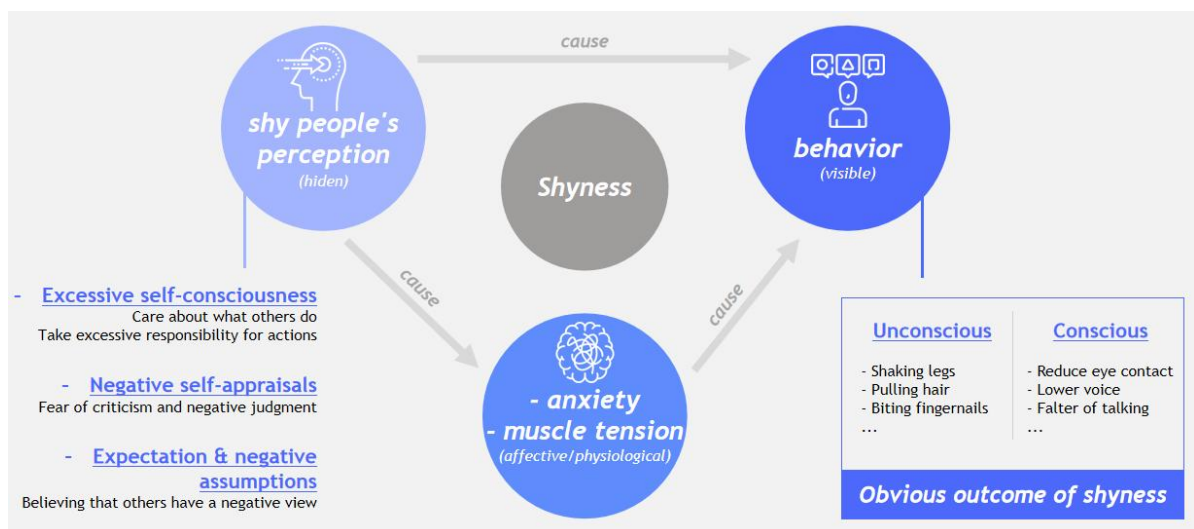


Fig. 1.1.1-1: Manifestations of shyness

In Fig. 1.1.1-2, mildly shy people may show behaviour such as blushing, sweating and trembling because of nervousness, embarrassment, timidity and other psychological factors. However, people who are severely shy may display behaviour such as blushing, sweating and body trembling because of holding stronger and more complex excessive self - consciousness, negative self - appraisals and expectations & negative assumptions (Buss, 1995), which can lead to significant behavioural inhibition. This is evidenced by shy people avoiding eye contact in social settings, speaking less, showing fewer facial expressions, and being too silent and quiet in social settings (Leary & Kowalski, 1995; Turner et al., 1990; Zimbardo, 1977).

Cognitive	Affective	Physiological	Behavior
Negative Thoughts	Embarrassment and Painful	Enhanced Heart Rate	Reserve/ Passivity
Fear of negative evaluation	Shame	Dry Mouth	Stare/ Hate
Worry/Apprehension	Anxiety	Trembling/ Shaking	Avoidance / Nervous
Self-Pity	Sadness	Sweating	Low Speaking Voice
Weak/ Dull	Loneliness	Feeling Faint/ Dizzy	Lethargic
Negative biases in the Self-concept	Depression	Leave Place Removed	Speech Problem/ Escape

Shyness described by CBT Model adopted (Beck, 2011).

Fig. 1.1.1-2: Shyness described by CBT Model adopted

1.1.2 Disadvantages & Advantages

The implicit motivation for the phenomenon of shyness reflects an approach-avoidance conflict (Carducci & Conkright, 2020), which is based on a psychological conflict in which people want to approach a goal, while at the same time avoiding it. Unlike introverts who basically consciously prefer to be inactive, shy people actually want to enter social situations but fear the possible risks of interaction and develop social anxiety. This leads them to a pattern of avoidance of social interaction and behavioural inhibition in social situations, such as voluntarily attending parties but not talking to others. This repeated fear and anxiety can interfere with normal social activities to varying degrees, such as making it difficult to meet new people, preventing people from expressing their opinions and values, or limiting others' positive perceptions of their abilities (Philip, 1977). High levels of social anxiety and persistent self-doubt caused by negative feedback from social interaction can lead to SAD (social anxiety disorder), where people have difficulty interacting with others, thereby affecting and destroying their interpersonal, academic and professional goals.

As with other personality traits, shyness also has many advantages. Shy people are more sensitive to observing and receiving the actions of others than they are to talking and expressing themselves, which means that they are more likely to be chosen as attentive listeners and talkers, than those who are not shy. According to psychologist Zimbardo (2007), "Shy people are usually better listeners and observers, they are more sensitive to details, and they are good at picking up on things that others miss." This sensitivity and subtlety give shy people a unique advantage in creative thinking and problem-solving. Also, their habit of

avoidance goes some way to avoiding conflict with others, manifesting itself in less aggression and higher pleasantness in social interactions. Kurtz and Tiegreen (2005) show that agreeableness from the Big Five personality variables is highly correlated with self-development.

1.1.3 Social Environment & Social Perception

In her book "Helping Your Shy and Socially Anxious Client" Lynne (2014) states that in a world dominated by extroverts, being shy or socially anxious can make life particularly challenging, and this is evidenced in many walks of life. Modern society is highly commercialized and business people with good leadership, teamwork, and negotiation skills are seen as successful. If an employee wants to stand out as a successful person in a company, they need to get used to working with people they don't know on a regular basis, and being engaging and talkative suddenly becomes important. Similarly, when the teacher asks questions of the class in class, shy children are less likely to answer questions and interact for fear of being the center of attention than non-shy children (Jones, 1994), where teachers may consider this to be evidence of lower motivation and achievement, in comparison to non-shy children.

As people are unable to directly experience and access each other's true thoughts, perceptions, emotions and psychology, their observing and perceiving each other's behaviour (e.g. gestures, movements, micro-expressions, tone of voice) has become an important way of building their perception of other colleagues and friends. However, the interpretation of other people's behaviour is susceptible to different meanings and outcomes, influenced by a wide variety of social perceptions, situations, cultures, histories, and many other factors. An example of a typical situational difference such as when someone sits upright in church, many people would see this as a sign of respect and piety, as the church is usually perceived as a place where silence is required. However, when the scene changes to an entertainment bar, this 'sitting upright' behaviour is more likely to be perceived as shy, formal and nervous, as the bar is an environment to experience relaxation and entertainment.

Fig. 1.1.3 shows an example of the same thing in different contexts, where the icon on the left hand side of the figure is more likely to be interpreted as 'B' or '13' according to its position within either a number system (top) or letter system (below). However, the influence on the meaning of the icon stems from a habit of normalization (regularity), and there is perhaps a small probability that the middle of 12 and 14 will be 'B', or the middle of A and C may also be '13'. In a similar way, when a person's shyness or introverted behavior occurs, others will judge the behavior as "positive" or "negative" based on the current context. This judgment has less to do with the behavior itself and more to do with its appropriateness in the current environment.

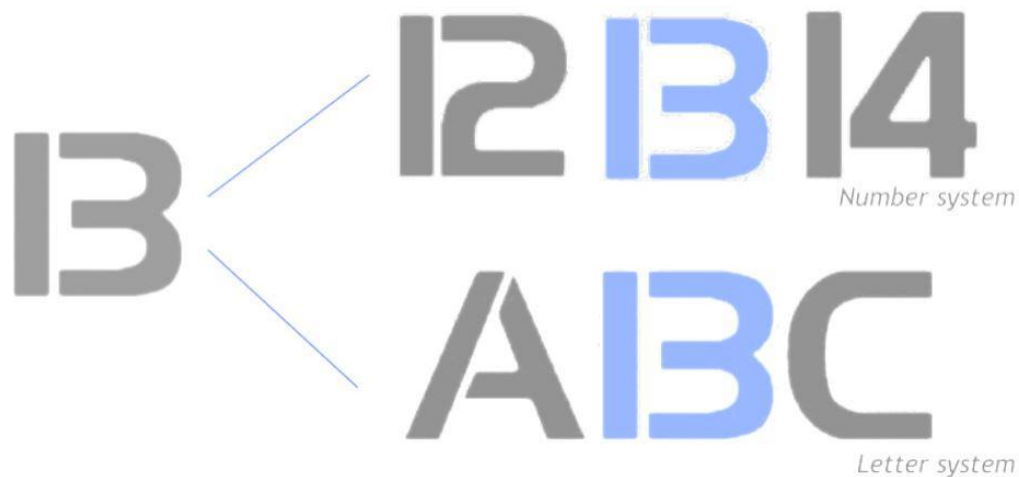


Fig. 1.1.3: Same icon in difference system

1.1.4 Perception in Unfamiliar Situation & Halo effect

People tend to do what is familiar, where unfamiliar situations can encourage feelings of shyness and the fear of being unsure of how others will act and the subsequent risks involved. Shy people take longer to adapt to new situations (Colleen, 2020), which means that they are more likely to show introverted behaviour in new social situations. However, most social interaction and communication today is basically a simple perception-interaction sequence (Fig. 1.1.4), where the shy person's behaviour is perceived by the other person, and accordingly, the social responses made by the other person trigger new behaviours from the shy person, forming a continuous cycle. Within this structure, the quality of communication and satisfaction will be more dependent on the perception of the person observing the behaviour. If there is a positive interpretation of the inhibited shy person's behaviour, then some positive feedback may act as an assurance and signal for the shy person to integrate more quickly into the unfamiliar situation. This is more likely to increase the quality and experience of the conversation; whereas if the perceived behaviour is negative, then this may lead to a decrease in satisfaction and understanding.

However, in unfamiliar social situations, people are more inclined to make quick inferences and guesses about the characteristics of others through first impressions (external factors such as actions, behaviour, and appearance), and the impression formed of a certain quality will influence people's expectations of other qualities of the same person. For example, people who appear clean and well-groomed are perceived to be better learners and more intelligent than those with a scruffy appearance. With this halo effect, overly rudimentary and generalized assessments of others are more likely to lead to prejudice and misunderstanding. It is often believed that eye contact can indicate that a person is paying attention and interested (Jiang, 2016), yet when a shy person avoids making eye contact, the other person may find it rude and further perceive the shy person as rude. This may continue to lead to negative expectations of the shy person, such as 'low level of learning and education in etiquette' and 'arrogance'.

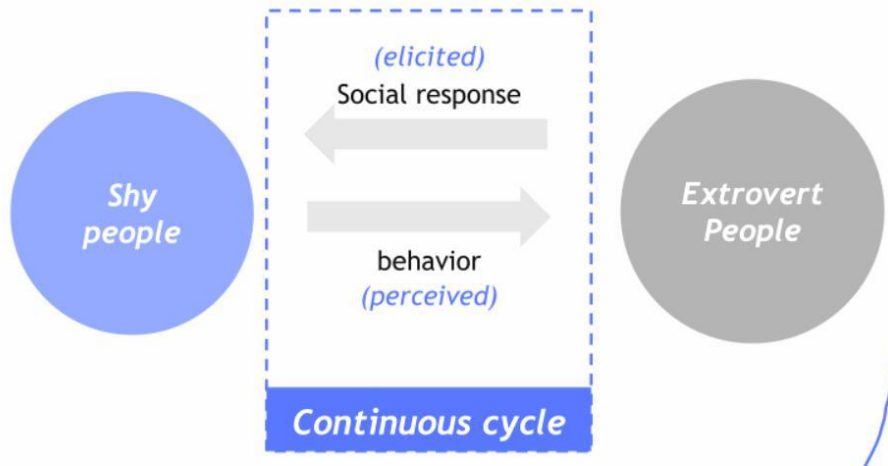


Fig. 1.1.4: Simple perception-interaction sequence between shy people and outgoing people

1.2 Problem Statements

1.2.1 Stigmatized Shyness

Shyness as a personality trait, as opposed to cheerfulness is often stigmatized and misunderstood. In social interactions, cheerfulness is widely recognized and promoted, while shyness is often labeled negatively. However, shyness should not be viewed simply as a flaw, but rather as a unique personality trait with deep historical and social reasons behind the emergence of this label. Historically, shyness has been viewed as a trait that does not conform to societal expectations. In Western culture, confidence and extroversion are idealized as symbols of success and charisma, while shyness is seen as a weakness. Psychologists Jones and Briggs (1986) noted that over the past few decades, society's over-promotion of extroversion has led to negative evaluations and discrimination against shyness.

This same difference in evaluations resulting from opposing personality traits is also reflected more broadly in self-reflection and self-evaluation. In 2023, when both "how can I become non-shy" and "how can I become non-extroverted" were searched for using a large search site. In Google, there are 818,000,000 web pages related to the phrase "how can I become non-shy", while there are only 257,000,000 web pages related to the phrase "how can I become non-outgoing", which is only 30% of the former. This search result reflects two issues: the first is the dissatisfaction and negative impression that shy people have about their "shyness". The second is that individuals may feel pressured and judged by others, and therefore desire to adapt to social expectations to get rid of their shyness. Cheek and Melchior (1990) found that some shy people wanted to change themselves because they believed that only by becoming extroverted would they be able to gain recognition and approval from others.

Similarly, the factor of social expectations of gender roles has an impact on the stigmatization of shy personalities. In most societies, men are expected to exhibit traits of extroversion and assertiveness, while women are expected to be more gentle and shy. This gender role stereotype exposes shy men to more pressure and discrimination. According to W Ray Crozier (2001), shyness can have rather different consequences for men and women. For example, it may be more acceptable for women to be shy than for men because men may be under greater pressure to change their behavior to fit into society (Archana & Rajbir, 2017). All of the above points reflect an inevitable reality when talking about shyness: shyness is often stigmatized and devalued. Shy people are often perceived as weak, flawed, or even considered to be misfits. This phenomenon can have many negative consequences and distressing effects for shy people, and it is crucial that the general public given the opportunity to understand that shyness is simply a non-polar character trait in contrast to being more outgoing.

1.2.2 Unequal Social Relationships

Shyness as a personality trait exists in a more vulnerable position in social situations. First of all, socialization focuses more on human interaction. Social activities usually require people to actively participate and express their opinions and emotions in order to deepen social and emotional connections between people. However, shy people may feel confused and uneasy in such situations. According to W Ray Crozier (2000), shy people always think that what they say will cause embarrassment, and they think it is better to say nothing rather than risk disapproval from others. Because they are more inclined to remain introverted and concerned about what others think of them, this may manifest itself in silence, inarticulateness, or discomfort in crowded environments. This high demand for social interaction puts shy people at a social disadvantage and often makes it difficult for them to fit in and express themselves naturally. When this introverted behavior is present, the general public generally holds more negative stereotypes of shy people, such as lack of confidence, being uninteresting, being out of touch, etc. Crozier (2001) added that others' perceptions of shy behavior often differ from the actual situation. Shyness is often misinterpreted as a characteristic of introversion, unfriendliness, or lack of confidence. This misinterpretation leads to prejudice and discrimination against shy people, making it more challenging for them to socialize.

It is undeniable that most people prefer more talkative and outgoing people in social situations, and to some extent reject shy, non-talkative people. A study by Hosoda, Stone-Romero, and Coats (2003) found that interviewers preferred extroverted, confident, and talkative candidates in the job search process. Interviewers generally perceived these candidates as more capable of leadership and teamwork, and this preference made it difficult for shy people to get a fair chance in the job search process. In addition, Rubin, Burgess, and Kennedy's (2003) study showed that people tend to prefer extroverted, active people when it comes to making new friends and maintaining friendships. This tendency to choose makes it possible for shy people to be ignored or ostracized in social circles, making it difficult for them to establish and maintain deep relationships. In societies dominated by extroverts, this bias makes shy individuals feel marginalized and excluded in social settings.

1.2.3 Reduced Social Experience

Because of others' misunderstanding of shy people's introverted behavior, the misconceptions generated by this behavior can have psychological and social consequences for shy people. In a study by Cheek & Buss (1981), where increased shyness exists, people are prone to be judged by others as more nervous, unfriendly, repressed, and unattractive because they make less eye contact with others and speak less. In addition, where shy people that meet for the first time are more unpopular than non-shy people (Gough & Thorne, 1986). This differential treatment results in shy people being socially disadvantaged and passive in an unequal position, with fewer opportunities for communication that diminish their own social experience. Furthermore, shyness is an inherent force that prevents people from building and maintaining relationships (Foley, Heath, and Chabot, 1986). Fewer relationships mean more missed academic and business opportunities, in part, hindering academic communication and affecting the life plans of shy people.

1.3 Research Questions

1.3.1 Is it possible to build a new dialogues that can improve two-way social experiences between shy people & outgoing people?

In order to improve the experience of shy people in social interaction, this thesis with exploratory projects hopes to explore new possibilities for social interaction between shy people and non-shy (outgoing) people. The perception-interaction sequence in the existing social state makes communication too straightforward and simple. This leads to both parties subconsciously making positive or negative judgments about each other without understanding each other, where shy people are more likely to be misunderstood. Moreover, communication is a two-way process of responding and interacting, where good social experiences require the efforts of both parties involved in the dialogue. Therefore, rather than changing the personality traits of a single party, the main research question should explore how to improve the existing social form and create new dialogues, for both sides of the conversations as research examples for the whole project.

1.3.2 Is it possible to ensure outgoing people understand shy people more effectively?

In order to address the main research question above, the secondary question of "how to understand" was derived. Much of the social vulnerability and inequality of shy people mentioned above is due to the fact that other people do not understand this group, and

introverted, avoidance behaviour is often misinterpreted as a lack of motivation, unkindness, and so on. In this case, to create a better social dialogue there is a need for outgoing people to understand shy people's shyness and the reasons for their shyness in a new and deeper way, thus avoiding pre-conceived notions (behavioural stereotypes). Therefore the second research question of this thesis will focus on how to more effectively enable others to understand shy people.

1.3.3 Is it possible to influence outgoing people's perception of shy people?

According to the second research question, the very act of "how to understand others" is subject to historical, cultural, social, and other factors that lead to differences. The fundamental question of how to get people to better understand shy people is to make them aware of their existing perceptions of something, which can be achieved through behavioural or habitual changes that subvert this perception. Behavioural change will lead the project from human-human interaction to human-object interaction, how to achieve this and answer the second research question are the first part of the design process that will follow.

1.4 Design Objects & Aims

In exploring ways to improve the social experience and promote better understanding between shy groups and others, the ideal new dialogue should employ more complex, multi-faceted mechanisms of communication and interaction. This new dialogue structure should go beyond the constraints of traditional dialogue and explore more the possibilities of using objects as a medium and tool for communication. While traditional dialogue often relies on verbal and written expressions, the subsequent design may consider introducing other forms of communication media, such as paintings, music, objects, and other non-verbal forms of communication, in order to help shy people express themselves better and be better understood.

At the same time, this study hopes to address the problem that shy groups are at a disadvantage in socializing, while at the same time discovering new potentials for human-object interaction states that extend from the scope of shy and cheerful groups to the everyday interactive relationships between people. In the long run, this new way of dialogue will contribute to the formation of good interpersonal relationships in a fast-paced society by eliminating the misunderstandings and stereotypes that come with traditional social interaction, thus creating more honest and deeper social connections. At the same time, the project will also help to promote social awareness and acceptance of shyness, which will have a positive impact on the development of society and the building of interpersonal relationships, to create an inclusive and more equal social environment.

1.5 Significance of Research & Design

This study aims to explore new ways of dialogue between shy and open groups and between people and objects through an interdisciplinary research approach throughout the exploration and design process, involving knowledge from the fields of psychology, sociology, and design, in order to increase the authority and academic feasibility of the design, to provide designers with insight and understanding and to open up new design directions and possibilities, as well as to increase the diversity of practice examples in the fields of psychology and sociology.

Firstly, by integrating knowledge from the fields of psychology and sociology to gain a deeper understanding of the characteristics, needs, psychological mechanisms, and behavioural patterns of shy people, scientific research can be used to support design. In this thesis, MBTI theory(based on Jung's research), perception-interaction sequence, downward spiral, and other structures closely related to these fields, are used to analyze the user group and design logic from different perspectives of shy people, social relationships, and perception.

The second point is that design plays an important role in sociology in promoting innovation in social structure and interaction. By providing new products, services, and environments, designers change the way society interacts and the organization of social structures. Woodcraft (2011) point out that design can contribute to the inclusiveness and sustainability of society, pay attention to the needs and participation of different social groups. Research has found that incorporating accessibility principles into design improves the usability of products and enables more people to participate in and enjoy them (Bigham et al., 2010), and this also applies to shy people who are passive at this stage.

Thirdly, designers should be aware of the needs and values of different cultural backgrounds and social groups in order to create products and services that are widely adaptable. Research by sociologist Hofstede (1984) has shown that cultural differences have a significant impact on product use and acceptance. Through sociological research methods, designers can better understand users' needs and expectations, and psychological findings can help them to study users' emotions, perceptions, and behaviours. Therefore, designers should consider the differences between different cultural groups in their designs to ensure the effectiveness and acceptability of their design.

To sum up, adopting an interdisciplinary research approach is important for designing a new dialogue for shy people in the field of design. The impact of design in the fields of sociology and psychology cannot be ignored. Designers contribute to the development of social structures and interactions through innovative solutions, while positively affecting the cognition and emotions of individuals. In addition, interdisciplinary research methods can expand the fields of application of psychology and sociology, bringing practical value to everyday life. Therefore, designers and researcher in related fields should deeply explore the potential of design in sociology and psychology, and continue to innovate and improve design practices to enhance the well-being of human societies and individuals.

Chapter 2. Literature Review

Shyness is often negatively perceived as social deficiency rather than a normal variant of human behavior (Scott, 2007). This literature review examines how shyness is conceptualized, assessed, and “treated” from psychological and sociological frameworks.

It is organized into three main sections: 1) Definition & Assessment of Shy People, 2) "Pathologization" and "Treatment" of Shyness , and 3) Potential alternative approaches.

2.1 Definition & Assessment of Shy People

When labeling someone as "shy," individuals may make such judgments based on personal experiences, societal norms, or body language. However, these factors are susceptible to cultural and regional influences, rendering them insufficient as objective assessment methods. In this study, to symbolically and systematically measure varying degrees of shyness, the "Revised Cheek and Buss Shyness Scale (RCBS)," commonly employed for shyness assessment, was utilized. In this scale, higher cumulative scores indicate higher levels of shyness, while lower scores suggest greater outgoing tendencies. The RCBS has demonstrated acceptable test-retest reliability and validity, showing correlations with other indicators such as social anxiety, social avoidance, and interpersonal difficulties (Cheek, 1990). It is important to note that the RCBS does not possess a binary nature, meaning it is not possible to categorize individuals as strictly shy or outgoing. Given that social environmental conditions change over time and in different situations, it is inappropriate to dichotomize individuals into "shy" or "not shy." Recognition of each dimension as continuous is essential. For instance, just as few individuals are considered world-class social athletes, similar to the rarity of world-class athletes in sports (Henderson, 2010). In summary, the terms "shy people" and "outgoing people" mentioned in this thesis do not represent an absolute division but rather refer to a group of individuals who are "more prone to experiencing shyness" or the opposite.

RCBS	
<p>INSTRUCTIONS: Please read each item carefully and decide to what extent it is characteristic of your feelings and behavior. Fill in the blank next to each item by choosing a number from the scale printed below.</p> <p>1 = Very uncharacteristic or untrue, strongly disagree 2 = Uncharacteristic 3 = Neutral 4 = Characteristic 5 = Very characteristic or true, strongly agree</p>	<p>___ 1. I feel tense when I'm with people I don't know well.</p> <p>___ 2. I am socially somewhat awkward.</p> <p>___ 3. I do not find it difficult to ask other people for information.</p> <p>___ 4. I am often uncomfortable at parties and other social functions.</p> <p>___ 5. When in a group of people, I have trouble thinking of the right things to talk about.</p> <p>___ 6. It does not take me long to overcome my shyness in new situations.</p> <p>___ 7. It is hard for me to act natural when I am meeting new people.</p> <p>___ 8. I feel nervous when speaking to someone in authority.</p> <p>___ 9. I have no doubts about my social competence.</p> <p>___ 10. I have trouble looking someone right in the eye.</p> <p>___ 11. I feel inhibited in social situations.</p> <p>___ 12. I do not find it hard to talk to strangers.</p> <p>___ 13. I am more shy with members of the opposite sex.</p>

Items 3, 6, 9 & 12 are reversed, recode before scoring. (1=5) (2=4) (4=2) (5=1)

Fig. 2.1:
Revised Cheek and Buss Shyness Scale

Semantically, the term "shy" is often associated with words such as "introvert" and "social anxiety," leading to potential confusion; however, fundamentally, they are distinct concepts. On one hand, as part of personality theory, Carl Jung propagated the terms "introversion" and "extraversion" as behavioral characteristics. According to Merriam-Webster's Dictionary, introversion is defined as a predominant interest in one's own mental self (Gohil,2020). Importantly, a person's introversion or extraversion is not necessarily correlated with shyness. Zimbardo (1977) categorized shy individuals into two groups: introverted shyness and extraverted shyness, highlighting that even many talk show hosts or stand-up comedians consider themselves shy. On the other hand, while shyness shares similarities with social anxiety disorder, Finch (2019) found, through a study, that 82% of individuals defined as shy do not meet the criteria for social anxiety disorder. In contrast to shyness, social anxiety disorder is recognized as a prevalent mental health condition that significantly impacts daily life and interactions. Lane (2008) posits that the transition of social anxiety from a form of social unease to a social disorder is a result of a multimillion-dollar initiative led by psychiatric professionals and pharmaceutical conglomerates.

2.2 The "Pathologization" and "Treatment" of Shyness

Beyond difficulties inherent to quantifying shyness, society further marginalizes shy individuals by positioning shyness as abnormal. Despite both paragraphs listing identical competent, likable behaviors, shy targets were rated more negatively across traits, eliciting stigma. Such experiments demonstrate that the very label of shyness evokes criticism and assumptions of incompetence—likely stemming from competitive cultural norms glorifying confidence and sociability (Scott, 2007).

Problematically, this stigma becomes internalized as shy individuals adopt self-defeating cognitive patterns, experiencing public situations as threatening (Crozier, 2014). And according to self-fulfilling prophecy dynamics, when shy individuals expect and anxiously experience rejection, others indeed view them more negatively—further perpetuating shame (Zimbardo, Pilkonis, & Norwood, 1975). To escape this vicious cycle where anxiety begets stigma begets escalating anxiety, shy persons often over-critique themselves as the root issue requiring change (Crozier, 2014; Zimbardo, 1977).

Many mainstream shyness treatments reflect this internalized stigma by pressuring wholesale change of shy behaviors to improve societal reception. Exposure therapy for social anxiety exemplifies this: systematically confronting feared social situations to attenuate anxiety and boost tolerance (Carducci, 2012). While beneficial for developing social confidence, exposure therapy psychologically burdens shy individuals to change, absent wider cultural forces accepting shyness differences Guideline (Guideline Development Group et al, 2013). This unjust one-sidedness further propagates the toxic belief that shy persons must adhere to an extraverted ideal or face exclusion.

2.3 Alternative Approaches

Present frameworks vilifying shyness as deviance overlook society's role perpetuating that narrative—requiring more change. And ample evidence counters supposed shy incompetence, with shy individuals demonstrating excellent introspective and observational capacities from avoided social spotlighting (Cain, 2012). Hence, interventions should nurture shy strengths while balancing outward demands, easing shy-extravert divides (Kingsbury, 2009).

First, enhancing mutual understanding between shy and outgoing groups could create welcoming, identity-safe environments to unlock shy talents, reducing distress (Cheng, Furnham, & McClelland, 2022). This echoes disability models framing impediments stemming not from stigmatized minority deficits but rather insufficient societal accommodations normalizing diversity (Haegele & Hodge, 2016). Destigmatization workshops teaching more nuanced, accepting shyness perspectives also show promise (Heiser, Turner, & Beidel, 2003).

Second, material objects and built spaces might act as social facilitators—putting shy persons at ease during interactions without identity sacrifice (Mehrabian, 1976). For example, toys help shy children connect through joint play, supplementing verbal channels they shun (Freeman & Kasari, 2002). And layout manipulating interpersonal distance calibrates sensory/crowding stressors wreaking cognitive overload that locks shy individuals out from exchanges (Evans & Wener, 2007). This environmental factor contributes to constructing a supportive platform, recognizing that difficulties arise from a mismatch with the environment rather than personal shortcomings.

Overall then, equitably fostering shy wellbeing requires targeting contexts around them—not just within them. Though shy persons can adapt better to mainstream norms through braving feared scenarios, lasting change demands replacing those fearful scenarios with accepting ecosystems embracing diversity. Progress begins with discussion.

2.4 Conclusion

This literature review has covered assessments both effectively capturing and sometimes misrepresenting shyness, societal stigmatization pressuring shy conformity, and recommendations for greater accommodation from misunderstood identities to welcoming environments. However, many open questions remain, including cross-cultural shy comparisons and developmental mechanisms interlinking nature, nurture, and context. Integrative research and clinical paradigms should continue advancing holistic shy perspectives to nurture personal growth alongside collective compassion.

Chapter 3. Methodology & Previous Tests

3.1 Reflective Practice

Reflective practice, widely employed across various industries and contexts, serves as a method to aid in synthesizing thoughts on acquired outcomes and assisting users in charting future developmental directions. Donald A. Schön, the originator of this concept, introduced the notion of "design as a reflective conversation," advocating for the integration of reflection not merely as an outcome-focused assessment but also as an integral part of the design process, encouraging contemplation on key issues and their interconnections at each stage of the design.

In this project, researcher has adopted this methodological approach as a pervasive reflective guiding principle, engaging in reflection on the practical outputs during every deliverable submission and transitional phase. Through this iterative process, they validate the accuracy and effectiveness of their reflections and cognitions through subsequent practical applications. Consequently, the project's theoretical foundation and its practical implementation form a dual assurance mechanism, ensuring the achievement of design objectives.

3.2 Preparation: Offline Questionnaire Survey

To investigate the manifestations and impacts of shyness in real social interactions, this project has devised a series of experiments incorporating research methods such as observation, interviews, and workshops. Multiple groups of mutually unfamiliar individuals, classified as shy and outgoing people, are required to participate in these experiments. To recruit a substantial number of unfamiliar participants, the researcher printed and strategically placed numerous copies of the Revised Cheek and Buss Shyness Scale (RCBS) across various floors of the campus to collect contact information from interested individuals (in Fig. 3.2-1 & Fig. 3.2-2). Participants are invited to voluntarily complete the questionnaire, and based on the scale scores, the researcher categorizes them into two groups: the shy group (higher scores) and the outgoing group (lower scores). The RCBS comprises 13 items to assess the three primary dimensions of shyness: emotional/physiological, cognitive, and behavioral. Utilizing a Likert five-point scale, responses range from 1 ("Not at all typical or true, strongly disagree") to 5 ("Very typical or true, strongly agree") (Cheek, 2013). Theoretically, all participants' scores should fall within the range of 13 to 65.

Following the scoring of a total of 38 valid questionnaires, participants are divided into two groups based on the calculated average score of 34.5: shy individuals scoring above the average and outgoing individuals scoring below the average. After careful screening, a total

of eight participants with relatively extreme scores were selected for further experiments. This group comprises four shy individuals and four outgoing individuals who are mutually unfamiliar, ensuring that prior interactions do not influence the credibility of the experiments.

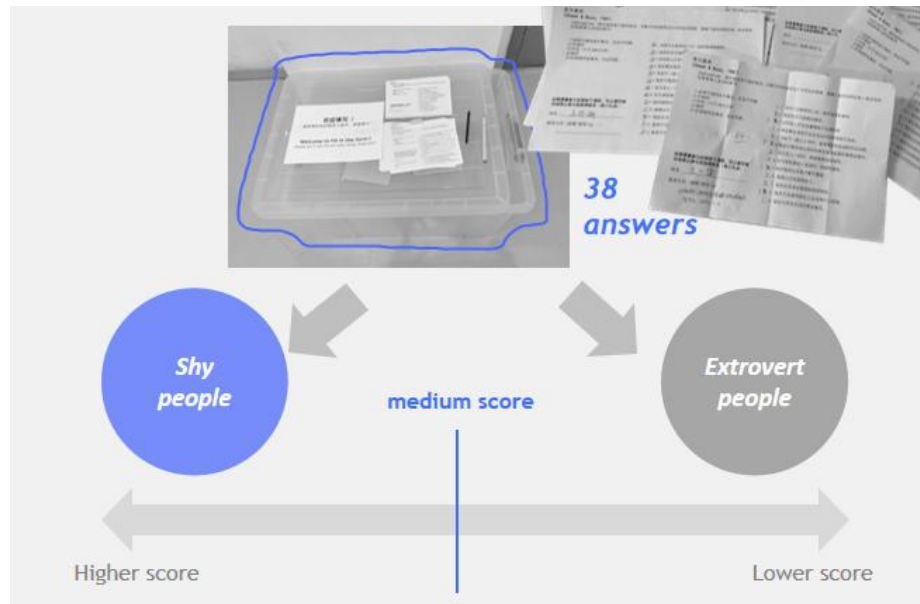


Fig. 3.2-1: Collect information and classify participants

**Shyness Scale
(Cheek & Buss, 1981)**

INSTRUCTIONS: Please read each item carefully and decide to what extent it is characteristic of your feelings and behavior. Fill in the blank next to each item by choosing a number from the scale printed below.

- 1 = Very uncharacteristic or untrue, strongly disagree
- 2 = Uncharacteristic
- 3 = Neutral
- 4 = Characteristic
- 5 = Very characteristic or true, strongly agree

If you are willing to participate in the follow-up offline survey, you can fill in the relevant information to get in touch with you (with small gifts) :

Full Name: _____

Contact information (email/wechat /qq...):

- ___ 1. I feel tense when I'm with people I don't know well.
- ___ 2. I am socially somewhat awkward.
- ___ 3. I do not find it difficult to ask other people for information.
- ___ 4. I am often uncomfortable at parties and other social functions.
- ___ 5. When in a group of people, I have trouble thinking of the right things to talk about.
- ___ 6. It does not take me long to overcome my shyness in new situations.
- ___ 7. It is hard for me to act natural when I am meeting new people.
- ___ 8. I feel nervous when speaking to someone in authority.
- ___ 9. I have no doubts about my social competence.
- ___ 10. I have trouble looking someone right in the eye.
- ___ 11. I feel inhibited in social situations.
- ___ 12. I do not find it hard to talk to strangers.
- ___ 13. I am more shy with members of the opposite sex.

Fig. 3.2-2: RCBS for this project

3.3 Test 1: Perception of Behavior

Because behavior is a crucial factor in observing and judging whether someone is shy, the entire Test 1 is designed to explore how outgoing people perceive and interpret shy behavior in social situations. This investigation may encompass habits, facial expressions, body language, verbal communication, and related aspects.

In this experimental phase, each participant consists of one outgoing person and one shy person. They are mutually unfamiliar and are arranged to engage in a conversation in a small room for approximately 10 minutes without knowing the complete purpose of the experiment, simulating a social interaction with an unfamiliar individual. Meanwhile, the researcher acts as an observer for this conversation, utilizing a video camera placed in the room to observe and record the behavior, dialogue, and events of both participants in real time.

The experiment is conducted four times, each recording the conversation of four pairs of unfamiliar participants to obtain a more diverse and comprehensive set of results. To ensure both qualitative and quantitative analyses, the experimental room minimizes the possibility of external disturbances, and the time discrepancy in the conversations of the four pairs is controlled within half a minute. The entire Test 1 process comprises two parts: the first is related to topic selection and the second focuses on behavior observation. These aspects will be elaborated and discussed separately in the subsequent sections.



Fig. 3.3: Records of 4 pairs of outgoing and shy people during experiment

3.3.1 Observation: Topics Choose

The first part of Test 1 involves the researcher observing four groups of participants in their selection of conversation topics, aiming to explore language preferences and topic choices when strangers interact for the first time. At the beginning of the experiment, each group of participants receives a sheet containing various topics (Fig. 3.3.1). This sheet comprises a total of nine suggested questions categorized into three types: judgment by others, sharing hobbies and experiences, and evaluating objective things. Participants are informed that they can either selectively refer to the topics on the sheet for conversation or engage in an unrestricted, free discussion with each other, with a time limit set at ten minutes. Simultaneously, the researcher records the choices, frequencies, and contributors of all topics discussed during the conversation for subsequent analysis and exploration.

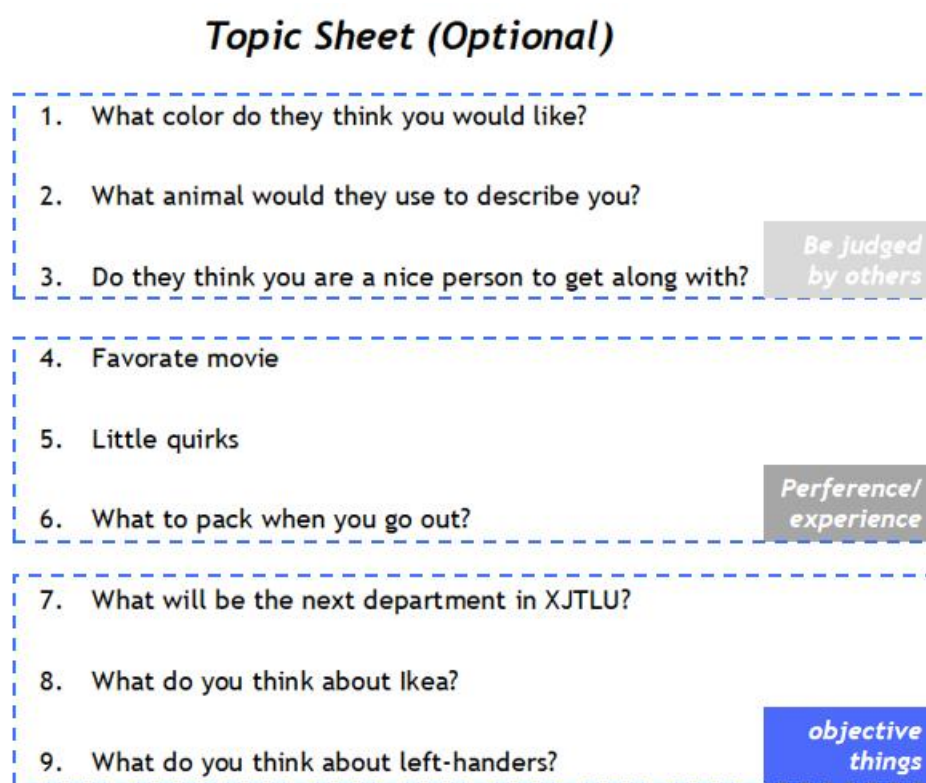


Fig. 3.3.1: Topic Sheet for participants

3.3.2 Results & Discussion of Observation

After the conclusion of the four experiments, a total of 13 topics were discussed among the four groups. On average, each group engaged in approximately three topics during the ten-minute period, revealing noticeable patterns in topic selection and initiation. Firstly, in Fig. 3.3.2, over half of the conversations revolved around discussing objective things, including inquiries about each other's views on current social issues, news, and events.

Approximately thirty percent of the topics involved personal experiences or preferences, such as discussing life at school or travel anecdotes. However, very few participants chose topics where others would evaluate them. Secondly, participants varied in the discussion time for each topic, with a tendency to talk more about their preferences and experiences, often leading to the emergence of new topics. In contrast, topics involving others' evaluations of oneself had the shortest duration (around one minute) and were challenging to transition into other topics. Finally, among the 13 discussed topics, outgoing people initiated 10, and the average speaking time of outgoing people was significantly longer than that of shy people.

The researcher observed that individuals in communication with strangers prefer low-risk topics (discussing objective things) and topics with shared interests (school life) to avoid potential negative judgments. Throughout the conversation, outgoing individuals took the lead as initiators, while shy people played a more passive role as listeners. However, when participants discussed topics related to experiences, they created more shared interests, allowing both outgoing and shy individuals to engage in more relaxed and prolonged conversations. In summary, facilitating more shared topics in a conversation to enhance the social willingness of both parties will be a crucial factor in improving the passive position and social experience of shy individuals.

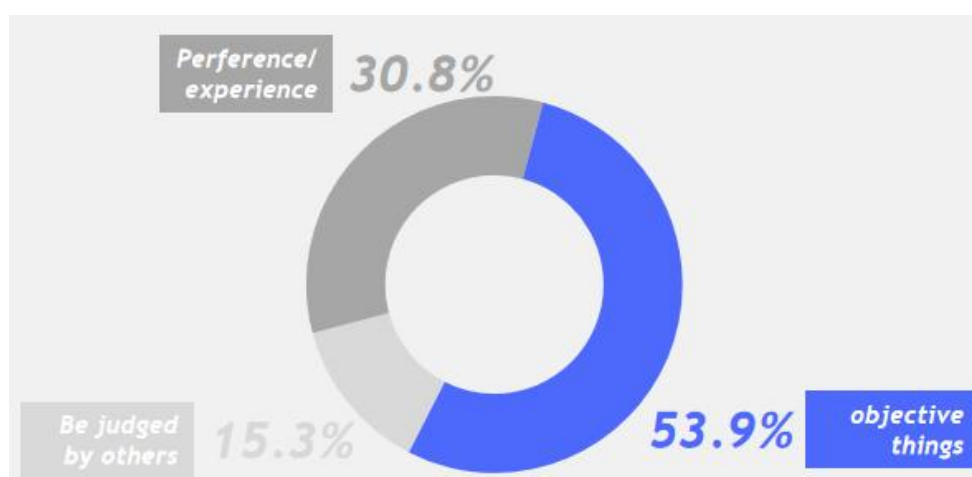


Fig. 3.3.2: Percentage of different types of topics chosen

3.3.3 Interview: Perceived Behaviors

The purpose of the second part of Test 1 is to explore the observation and interpretation of shy people's behavior by outgoing individuals, aiming to identify differences in the interpretation of the same behavior among different types of individuals. In this experimental phase, the researcher, acting as an observer, will meticulously observe and record all subtle actions exhibited by shy people during conversations with others, such as a lack of eye contact or body concealment. Subsequently, the researcher will conduct separate inquiries with both shy and outgoing individuals, focusing on different aspects.

For the interview with outgoing people, the primary focus will be on asking about the behaviors they observed in shy people during the 10-minute conversation. The behaviors observed by outgoing individuals will be compared with those recorded by the researcher. Outgoing participants will also be invited to express their perspectives on the observed behaviors.

Conversely, the interview with shy people will concentrate more on whether they are aware of their observed behaviors, along with exploring the reasons and thoughts behind these behaviors. To ensure that participants do not withhold genuine information due to concerns about others' opinions during joint interviews, the interview segment will involve private one-on-one communication between the researcher and each participant.

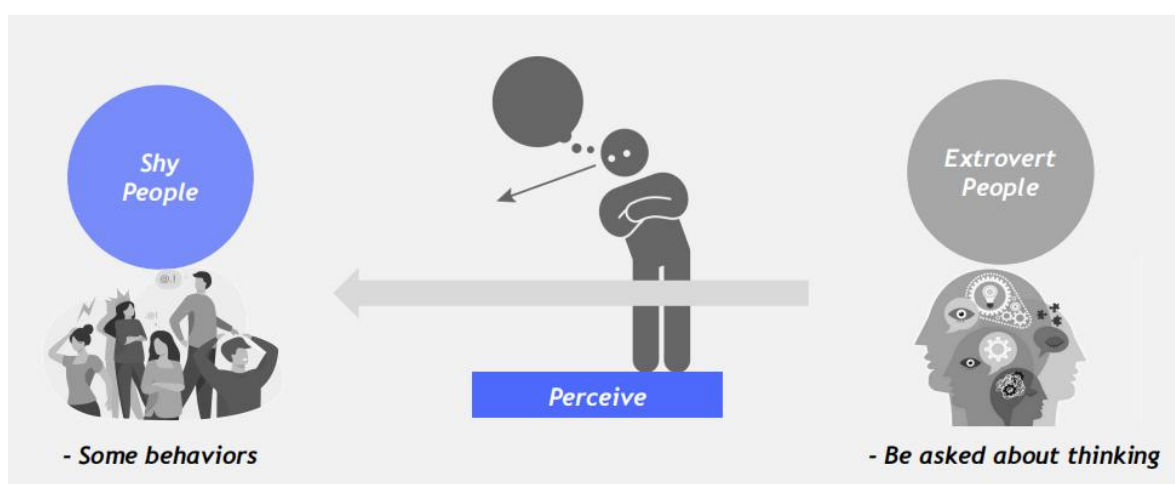


Fig. 3.3.3: Second Process of Test 1

3.3.4 Results & Discussion of Interview

Based on the observational results from the four experimental groups, the researcher documented the reserved behaviors exhibited by the four shy individuals in social interactions. These behaviors included a lack of eye contact, blushing, responding with brief and high-pitched tones, body part concealment, leg shaking, among others. However, when questioning the four outgoing individuals about their observations of the shy individuals' behavior during the conversation, approximately 67% of shy behaviors were noted by them.

As illustrated in Fig 3.3.4-1, areas that were more easily observed are shaded in blue, primarily focusing on the face, torso, and hands. Behaviors associated with tone of speech, sitting posture, and the lower body were more likely to be overlooked and are depicted in gray. Similarly, when the observational results were reported to the shy individuals, they indicated an awareness of the occurrence of these recorded behaviors. This suggests that the majority of shy individuals could clearly perceive themselves as "shy" in the current social context.

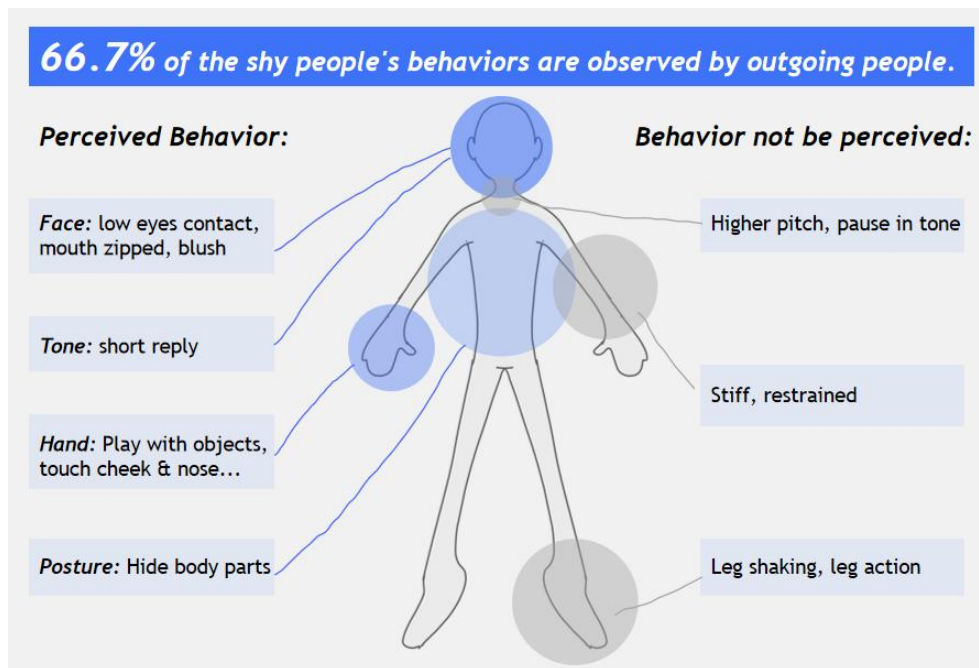


Fig. 3.3.4-1: Perceived shy behavior and Ratio

Subsequently, when interviewing both outgoing people and shy people on their perspectives regarding the same observed behaviors, some interpretive differences emerged (as depicted in Fig. 3.3.4-2). Firstly, shy individuals perceived concealing body parts as a habitual behavior that enhances their sense of security, whereas outgoing individuals considered it an expression of a passive stance. Secondly, the brief and soft-spoken responses by shy individuals were attributed to thoughtful consideration of how to better answer questions by themselves, while outgoing individuals misconstrued this behavior as a reluctance to further engage in conversation. Thirdly, touching their own face or engaging in such actions was viewed by shy individuals as a means of enlivening the atmosphere during moments of silence, whereas others interpreted it as a signal of tension or impatience.

	Shy People think...	Outgoing People think...
Hide body parts	- Habit - Sense of safety	- Timid - Passive
Low voice /short answer	- Think for better reply - Lack of confidence	- No desire to continue
Touch face /nose	-Distraction to relieve - Liven up the atmosphere	- Restless

Fig. 3.3.4-2: Misunderstanding of perceived behavior

The researcher identified that differences in understanding the same observed behaviors between outgoing people and shy people could potentially impact the quality of their communication. Actions perceived by shy individuals as easing tension were viewed by outgoing people as negative signals, leading to unequal social intentions and feedback.

Moreover, due to the fear of judgment among shy individuals (Prisbell, 1988), they find it more challenging to express their true thoughts directly to outgoing people, deepening the misunderstandings. In this scenario, achieving expressive freedom for shy individuals and altering outgoing people's perceptions and understanding of shy behavior might effectively enhance the social experience for both parties. These two potential factors could influence subsequent design processes and manifest as an experimental aspect.

3.4 Test 2: Difference of Understanding

To review and address the conclusions and issues derived from Test1, Test2 delves more into the exploration of objects in conversation, the dynamics between individuals, and their roles. It aims to investigate the impact of intervened objects on the expression of shy people and the understanding of shyness and behavior by outgoing people (Fig. 3.4-1). This discussion centers on the potential of objects as a new medium to enhance the social experience for both parties. In this experimental phase, the researcher prepared colored boards (in Fig. 3.4-2) as intervention objects, prompting participants to engage in three aspects of the test: describing emotions and making associations, narrating an experience, and expressing current feelings. The entire test was conducted in a workshop format, known for its relaxed and communicative narrative style. As Bruner (1990) expressed, "we get to grasp who we are, who they are, and our relationships by creating tales about ourselves and others," facilitating the exploration of subtle influences between objects and individuals.

Similar to Test1, Test2 involved the researcher as an observer, guiding participants through the next steps and recording results via camera and video. Consistent with Test1, each experimental group consisted of one outgoing person and one shy person, both mutually unfamiliar, completing four sets of tests with different participants. To maintain consistency across the four experimental groups and alleviate time-related tension, participants were allotted approximately 30-40 minutes to complete the three stages of the workshop, followed by interviews conducted by the researcher at the conclusion of each stage.

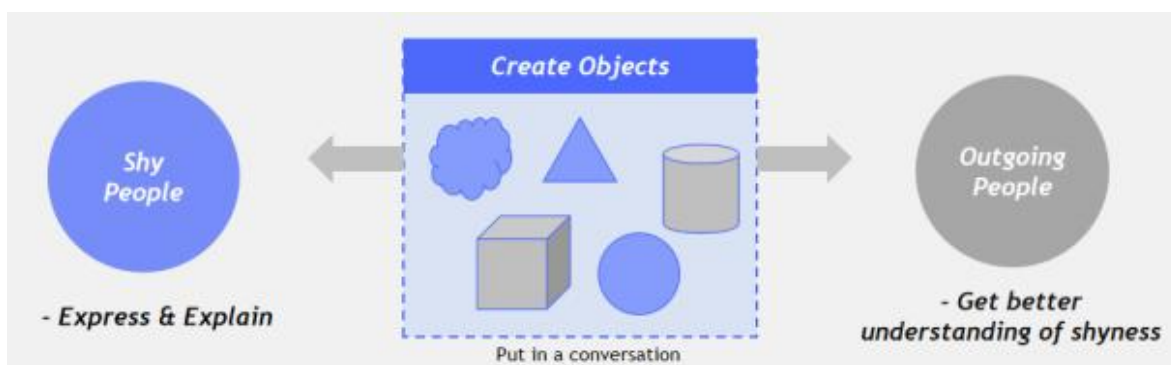


Fig. 3.4-1: Process of Test 2

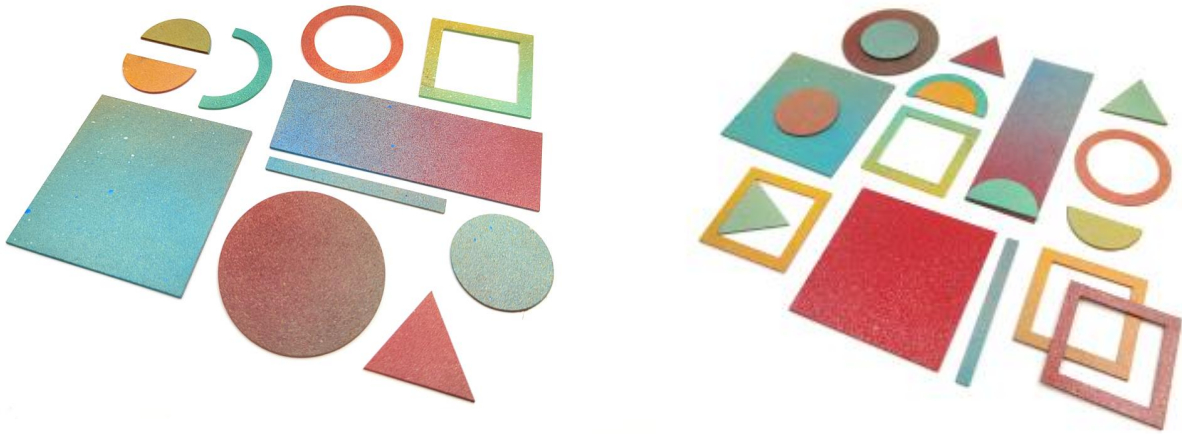


Fig. 3.4-2: Model of color boards

3.4.1 Workshop 1: Describing & Matching

In the first stage of the workshop, the exploration primarily focuses on the divergent interpretations of the same object, description, or emotional atmosphere by both parties. Shy individuals receive slips of paper containing adjectives such as happy, awkward, fearful, gentle, and so forth. They choose three adjectives from the list and, without revealing the adjectives to others, assemble the colored boards to create composite images representing these three words. Subsequently, outgoing individuals, based on the visual description provided by shy participants, select adjectives from the entire set that they believe correspond to the images.

Since similar individuals may have subtle differences in interpreting the same image, the primary criterion for determining whether outgoing individuals and shy individuals share the same interpretation in this stage relies on the similarity of the atmospheric qualities of the chosen adjectives. For instance, "happy" and "enthusiastic" convey a similar atmosphere, indicating that their interpretations of the same image are alike (Fig .3.4.1).



Fig. 3.4.1: Demonstrations of Test 2

3.4.2 Results & Discussion of Workshop 1

After recording data from four experimental groups, each comprising 3 sets, totaling 12 word and image pairings, outgoing individuals demonstrated an average comprehension of 75% of the adjectives or atmospheres intended by shy individuals. In a typical case (see Fig. 3.4.2), shy participants used this exercise to convey an "awkward" atmosphere, as the extensive use of dark colors symbolized a situation with many people and a sense of oppression. However, outgoing individuals interpreted it as "enthusiastic" because it portrayed a lively atmosphere with many people gathered together.

The researcher observed that even when both parties could make similar interpretations of the content of the same image, they still exhibited differences in the emotions and descriptions conveyed by the images. This suggests that they have distinct perceptions of the objects depicted in the images.

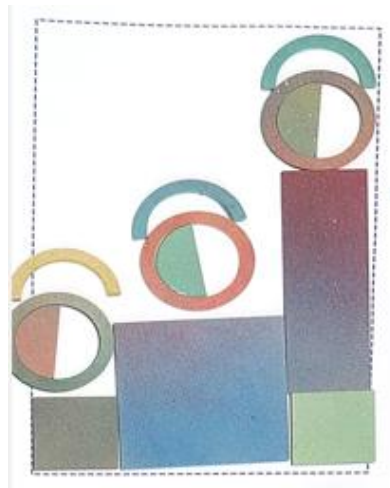


Fig. 3.4.2: Example from shy people's description

3.4.3 Workshop 2: Storytelling

The second stage of the workshop is similar to the first one, where shy individuals are required to use cartoon scenarios and colored boards to construct a narrative or experience. Following the completion, outgoing individuals gradually reconstruct the original story structure through a combination of guessing and questioning, engaging in communication with shy individuals. Additionally, after the initial storytelling session, roles are reversed, with outgoing individuals creating scenes and shy individuals reconstructing them, followed by a similar testing session. Building upon the previous stage, this test provides both parties with more freedom and autonomy, facilitating the exploration of similarities and differences in their communication within a more natural setting.

3.4.4 Results & Discussion of Workshop 2

In this phase, outgoing individuals can generally infer the stories shy individuals intend to depict, but discrepancies arise in certain details. When discrepancies occur, outgoing individuals proactively inquire about questions such as "Why is this..." or "Why do you want to describe this story?" to generate new topics. Similarly, shy individuals, in order to address the confusion, begin to provide explanations for the drawings, initiating discussions about related experiences and feelings.

Through this, the researcher discovered that the generation of new common topics can be achieved by arousing the curiosity of outgoing individuals through objects. In this scenario, shy individuals are naturally guided to actively express themselves. Therefore, the intervention of objects does enhance the social willingness of both parties to some extent, providing more potential for strengthening the self-expression of shy individuals in social interactions.

3.4.5 Workshop 3: Feeling Expressing

The final stage of the workshop serves as a summary of the first and second stages, aiming to explore the potential positive roles of objects in social contexts. In this step, each pair of shy and outgoing individuals utilizes colored boards to create various configurations, conveying their current feelings and moods to each other in a non-verbal manner (Fig. 3.4.5). Subsequently, they are encouraged to engage in open discussions about these depictions.



Fig. 3.4.5: Records and process of Workshop 3

3.4.6 Results & Discussion of Workshop 3

All four pairs of outgoing and shy individuals were able to understand each other's emotions through the combination of colors and shapes in the created drawings. Participants expressed that, compared to explicit verbal language, this non-verbal form of expression could subtly and comprehensively showcase their feelings to each other. Additionally, the individuals guessing the content of the images pointed out that this approach allowed them to preserve more imaginative space about the other person's emotions.

Furthermore, through the researcher's observation, both outgoing and shy individuals were more relaxed and proactive in their communication during this process compared to the earlier tests.

For shy individuals, the use of objects made the process of expressing ideas indirect, gradual, and natural. For outgoing individuals, this test enabled them to understand the other person through various non-verbal means and perspectives. Overall, objects in this stage served as effective mediators, playing a positive role in conveying and understanding emotions. As a new form of dialogue, it facilitated shy individuals in expressing themselves while assisting outgoing individuals in a more comprehensive and nuanced understanding of shyness.

3.5 Summary & Design Opportunity

This part describes a series of experiments exploring shyness and social interactions between shy and outgoing individuals. Various methods were utilized including observation, interviews, and workshops with colored boards as intervention objects. Key findings showed that shy individuals have distinct behavioral interpretations compared to outgoing people, even for identical actions, contributing to communication barriers. However, intervening objects created common discussion points and facilitated self-expression.

Several design opportunities emerged:

1. Using objects as mediators to improve conversational possibilities between shy and outgoing people. The objects enhanced understanding and willingness to communicate when interpreting meanings.
2. Sparking curiosity through objects introduced new shared topics, increasing social motivation for both shy and outgoing participants. This allowed shy individuals to naturally express themselves more during interactions.
3. Enabling freer self-expression for shy people and improving outgoing people's comprehension of shyness could mutually optimize social experiences. Non-verbal object arrangements conveyed emotions subtly.

Chapter 4. Design Process

Even with equivalent content interpretations, inherent affective perceptions differed between shy and outgoing people. Thus identical scenarios evoke distinct internal responses across personality dimensions. Designs must accommodate these nuances.

In summary, leveraging material artifacts and environments as social catalysts mitigated barriers, revealing strengths of shy individuals in social contexts while reframing outgoing interpretations. Further research should advance implementable solutions transforming these insights.

4.1 Selection of Product Type

4.1.1 Reason of Choosing Set of Furniture

In the initial phase of this project, three potential forms—furniture, jewelry, and tabletop games—were considered for design. The researcher found that the category of furniture offered more possibilities in both design and usage environments. On one hand, since the research and usage scenarios of this project are closely related to social contexts, the communication, behavior, or media involved are more or less associated with furniture. In this context, furniture serves as a "latent" and "hidden" presence, and its high environmental integration helps avoid the intrusive nature of design in the scene. On the other hand, the introduction of new types of products leads to new interactions, prompting individuals to spend more time getting accustomed to novel ways of interaction, potentially overshadowing existing commonplace interactions. Moreover, new products have the potential to disrupt social norms, making genuine social interactions intentional.

The reason for envisioning a design output as "a set of furniture" rather than "a piece of furniture" lies in the fact that a set of furniture can be used individually or as a complete set. Different furniture components can be employed in various scenarios, thus expanding the applicability and context of the design. When used as a set, it enhances the product's unity in terms of functionality and appearance, allowing users to intuitively perceive and understand the intended coherence of this design series.

4.1.2 Furniture from Social Scenario

After establishing furniture as the overarching design direction, three types of products—chairs, tables, and desk lamps—were chosen as the envisioned design outcomes, given their significance as integral components of furniture in social contexts (Fig. 4.1.2). Firstly, chairs provide a space for individuals to sit, relax, and engage in conversation. The design of chairs can influence people's posture and comfort, thereby impacting their modes of communication and interaction.

Secondly, tables, serving as the focal point for social interaction, act as a medium for behavior and communication, offering a shared space for exchanging information, dining together, and establishing eye contact.

Thirdly, desk lamps contribute localized illumination in social environments to create ambiance, influencing people's moods and perceptions of the surroundings. Additionally, the light generated by desk lamps facilitates better observation of objects, as well as individuals' body language and facial expressions, thereby fostering communication and interaction between the parties involved.



Fig. 4.1.2: Furniture from social scenario

4.2 Relationship between Furniture & Shy Behavior

4.2.1 Reason of Combining Furniture & Shy Behavior

Due to the current lack of a robust theoretical foundation linking furniture and shy behavior, the theory connecting furniture with shy behavior in this study is exploratory in nature. The first rationale is to "break habitual patterns," as mentioned earlier in the Placebo Project (Dunne & Raby, 2001). This aims to make individuals aware of the fundamental way in which a particular perception exists by changing existing habits and subverting ingrained perceptions. In this study, to make outgoing people aware of their inherent perception of "shyness," the furniture undergoes a degree of deconstruction, maintaining most of its habitual functionality while incorporating some shy traits in interaction. When outgoing people interact with the furniture, they may feel shocked or curious because the interaction deviates from their accustomed habits. By disrupting habits, people can discover and become aware of the "irrational" shyness within the furniture.

The second reason is related to the perceived object. Furniture simulates shy behavior and incorporates it as part of its traits, shifting the perception of outgoing people observing shyness from a subjective perception when the object is shy people to a more objective perception when the object is furniture (shown on Fig. 4.2.1). This also explores whether, in the context of social interaction using this series of furniture, the reasons for shy people's behavior, as perceived by others, transform from being caused by personal autonomy to being caused by furniture. Similarly, in this situation, biases generated by outgoing people through observing behavior would be directed towards furniture rather than shy people.

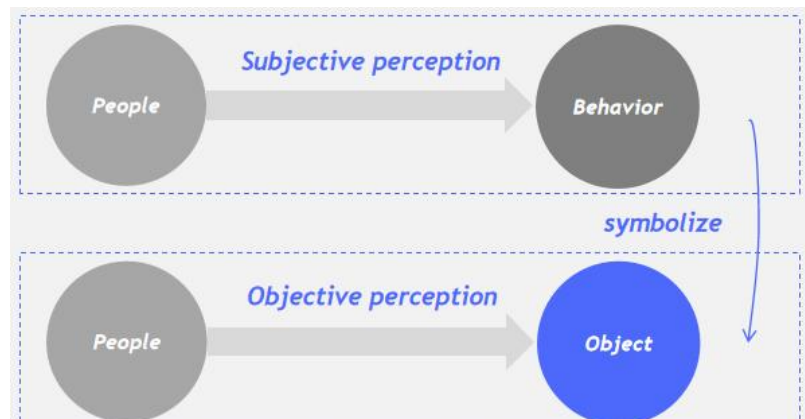


Fig. 4.2.1: Changes in the object of perception

The third reason focuses on creating an environment similar to that of shy people's habits. As indicated by the various test sections in the preceding text, outgoing people and shy people have differing perspectives on the same object. It can be inferred that both parties have distinct understandings of existing social scenes and furniture. If current social settings are considered "designed for the majority or for outgoing people," conversely, furniture imbued with shy traits can be viewed as "designed for shy people." In this envisioned scenario, by placing outgoing people in a shy environment, this study aims to explore the reflective and interpretative impacts of this highly differentiated "new dialogue" on the outgoing individuals.

4.2.2 Correspondence between Furniture & Shy Behavior

To systematically guide the subsequent design process, the correspondence between furniture and behavior will be approached from two aspects: the inherent characteristics of the furniture and the sequence of furniture use in social scenarios. Based on the preceding test section, several frequently observed shy behaviors include keeping a distance, hiding body parts, speaking less, and lack of eye contact. Chairs exist in pairs in social settings, maintaining a certain distance between them. Therefore, the subsequent design will consider incorporating the behavior of "keeping distance" with the characteristics of chairs. Given that the table occupies a central position in interaction and communication, serving both as a means of conveying information and an obstruction or shield, it is more appropriate to associate the behavior of "hiding body parts" with the characteristics of the table. The light emitted by the lamp can influence how individuals observe each other's facial expressions

and body language in social interactions. This factor can be closely linked to facial behavior such as "low eye contact" and verbal behavior such as "few words."

In social contexts, the use of chairs, tables, and lamps also exhibits a sequential pattern. Initially, individuals preparing to engage in a conversation choose a comfortable pair of seats, pull out chairs, and sit down. Subsequently, both parties in the interaction use the table to place items such as beverages, phones, or their hands. Finally, the entire interaction is enveloped in the atmosphere created by the lamp's indirect influence. Hence, the exploration, design, and testing processes will follow the sequence of chair-table-lamp.

4.3 Inspiration Collection

In this section, the researcher analyze projects from other domains or designers that integrate various behaviors into furniture, defy conventional design, or incorporate shyness into product design.



Fig. 4.3-1: Pillow Light, Simon Frambach

It functions just like any other lamp except that its shade is made of soft foamed polyurethane, so it feels more like a pillow than a traditional lampshade (Derringer,2013).



Fig. 4.3-2: WEATHER OR NOT, JungHoon Lee, Dongkyu Lee

Reading the weather is one thing, while experiencing it through sensory perception is an entirely different experience. Named after the floral signal of springtime, this product, Dandelion, features soft "spores" on the device's top that allow fingers to perceive temperature and wind strength through tactile sensations.



Fig. 4.3-3: MIRROR CHAIR, Kai Linke

“Mirror Chairs” is an edition that so far includes 4 different chairs. The general idea behind this session was deformation (Studio Kai Linke, 2009).



Fig. 4.3-4: Slide-Useless and dangerous, Raphaël Hoesli

A whimsical yet impractical concept, the design envisions a playground slide culminating in a terminal fork, rendering it both useless and potentially hazardous.



Fig. 4.3-5: Napkin table, Graduates of industrial design from tunghai

The purse-like carrier comprises a pair of straps on either side that attach around the neck, just like a necklace. once the two diners fasten the clips around them, the fabric stretches into a surface for them to put plates, forks and cups onto (HLJ ,2014).



Fig. 4.3-6: The courtesy table, Marleen Jansen

Based on the concept of a seesaw, this double table incorporates integrated seating under the surface. Utilizing a swaying hinge, individuals on both sides of the table become interdependent, as the movement of one person directly affects the person on the opposite side, maintaining a seated position.

4.4 Design Part 1: Chair Design

4.4.1 Concept Generation

In the initial Concept 1 (Fig. 4.4.1-1), a horizontal bar connected two opposing chairs at the bottom to maintain a fixed distance between outgoing people and shy people. Simultaneously, as the seat and backrest of the chairs were connected by flexible material, the horizontal bar served as a medium to convey actions, allowing both parties to sense each other's movements through the chairs during communication. However, after seeking feedback from both shy and outgoing individuals regarding Concept 1, numerous responses indicated that the functionality of the horizontal bar conveying movements was too intrusive, and not everyone desired to perceive subtle actions from the other person. Additionally, the paired chairs resembled more of an entertainment facility, making it visually challenging to associate them with conventional chairs.



Fig. 4.4.1-1: Concept 1 of Chair

In the refined Concept 2 (Fig. 4.4.1-2), the design discarded the rocking feature of the chairs, retaining only the function of maintaining distance using the horizontal bar. The appearance avoided overly intricate design, aiming for intuition and simplicity, ensuring immediate recognition of the chair's nature at first glance. Since the horizontal bar is fixed between the two chairs, individuals are compelled to remain at a fixed distance and find it challenging to approach or move away. In this scenario, the divergent perceptions of the same distance by shy and outgoing individuals will be explored in the model testing phase.

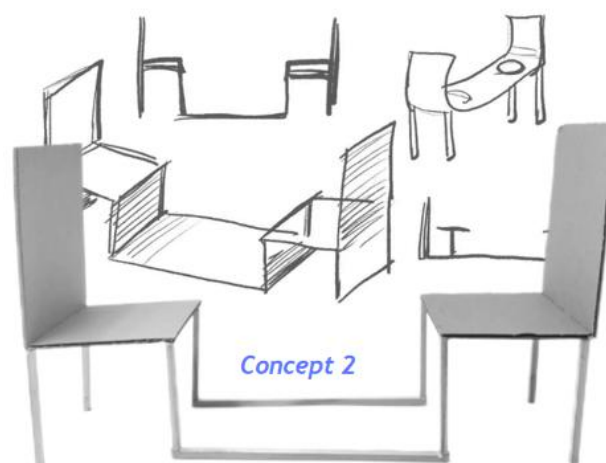


Fig. 4.4.1-2: Concept 2 of Chair

4.4.2 User Test, Problem & Finding

At this stage of product design, a full-sized functional prototype was crafted using wooden boards and sticks. Four outgoing individuals and four shy participants were invited to test the draft model's functionalities, dimensions, and ergonomics. Outgoing and shy individuals were instructed to move the chairs to a position they felt most comfortable when facing a stranger. From Fig. 4.4.2, it is evident that, compared to outgoing individuals, shy people tended to position themselves farther away, with an average shy distance of approximately 150 centimeters. This dimension was utilized to determine the distance between the horizontal bars connecting the chairs.

Regarding functionality, a fixed-size horizontal bar cannot cater to the varied comfort preferences of different shy individuals, emphasizing the importance of allowing them to choose their distance. Additionally, the connection between the horizontal bar and the chair legs needs further consideration for its robustness. In terms of ergonomics and dimensions, testers reported issues with the chairs being too high, and the overall design appearing excessively rigid.

Based on the identified issues, several corresponding solutions have been proposed and will be considered in the final design phase:

1. The chair will be designed to allow movement only from the side of shy individuals, enabling them to adjust the distance from others.
2. The seat and backrest will reference average ergonomic dimensions, incorporating soft materials or increasing perforated sections as appropriate.
3. The connection between the horizontal bar and chair legs may involve a combination of screws and tenons for enhanced stability.

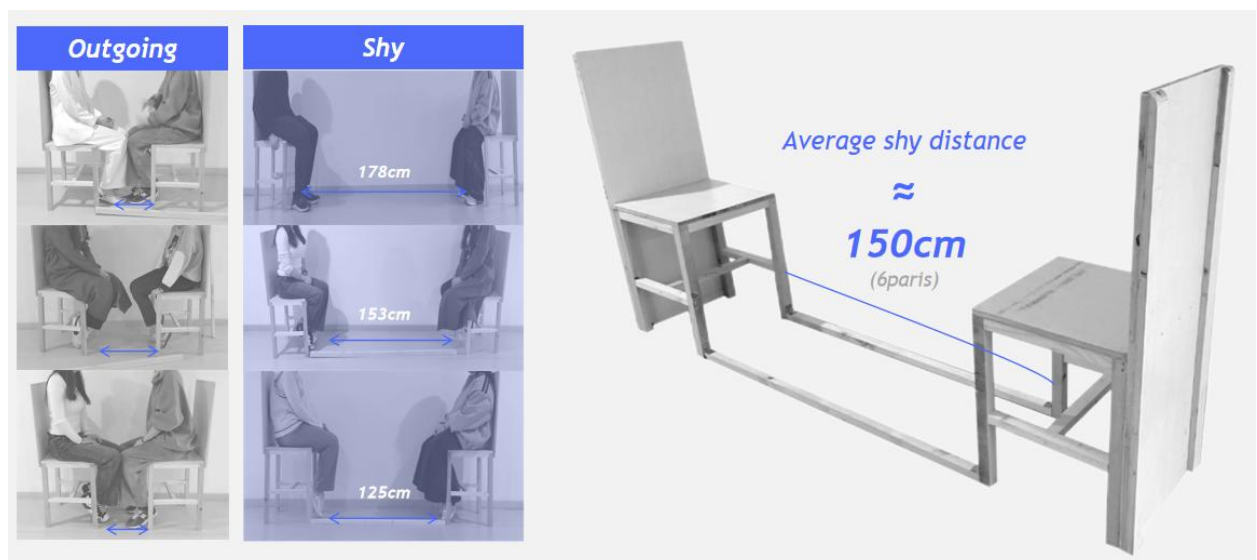


Fig. 4.4.2: Findings from chair

4.5 Design Part 2: Table Design

4.5.1 Concept Generation

To associate the table with the "hide body part" behavior, Concept 1 introduced the possibility of concealing hands beneath the table (Fig. 4.5.1-1). When shy individuals place their hands on the table, equipped with numerous sensors, two panels on the table will move based on sensor information, hiding the hands behind them. For outgoing individuals, they can only see the panels blocking shy people's hands without discovering their actual hands. However, following the collection of feedback and evaluation, researcher found that using moving panels to cover shy people's hands was too deliberate, drawing excessive attention from outgoing individuals. Additionally, regarding the table itself, on one hand, the autonomously moving parts seemed too peculiar; on the other hand, the moving panels hindered the functionality of placing items on the tabletop.

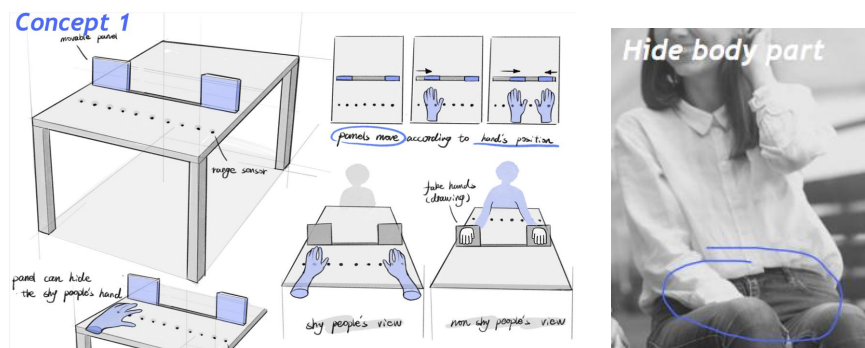


Fig. 4.5.1-1: Concept 1 of Table

In Concept 2 (Fig. 4.5.1-2), the table ingeniously and indirectly prevents hands from being exposed in the line of sight. The tabletop is composed of transparent acrylic, with a "hide frame" beneath where hands can be placed. The table's height is intentionally designed to be higher than ordinary, as people feel discomfort placing their hands on a higher tabletop. Hence, they are more inclined to place their hands in the frame to achieve the goal of concealing their hands. The transparent acrylic tabletop allows for observing the concealed hands. With the intervention of furniture, the act of hiding hands becomes a "coerced behavior" due to the unique structure of the table.

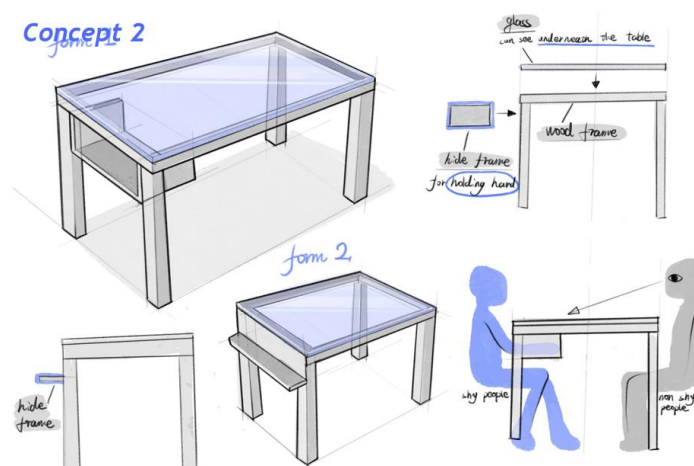


Fig. 4.5.1-2: Concept 2 of Table

4.5.2 User Test, Problem & Finding

Similar to the functional prototype testing for the chairs, four groups of outgoing people and shy people were asked to sit at opposite ends of the table to evaluate its functionality and dimensions. Regarding the results (Fig. 4.5.2), participants uniformly placed their hands in the envisioned "hide frame" due to the elevated height of the tabletop. Furthermore, compared to shy people, outgoing people more frequently reported feeling constrained by the frame, as they engaged in more hand movements during communication. researcher observed that when both parties needed to pass objects, they chose to do so beneath the tabletop, rendering the transfer more discreet and initiating a potential connection.

However, post-testing, researcher identified issues with the acrylic surface area, which was too large, allowing all activities beneath the tabletop to be observed, thus compromising the concealment function. Additionally, the dispersed wooden hide frame, along with the central gap, created a lack of visual connection between the participants.

Corresponding solutions:

1. Reduce the surface area of the acrylic panel and position it in the center of the tabletop to enhance the sense of concealment, allowing hand movements to be observable only when objects are being passed between the two parties.
2. Integrate a more unified frame in terms of shape and form to enhance the "bridge" for communication between the two participants.

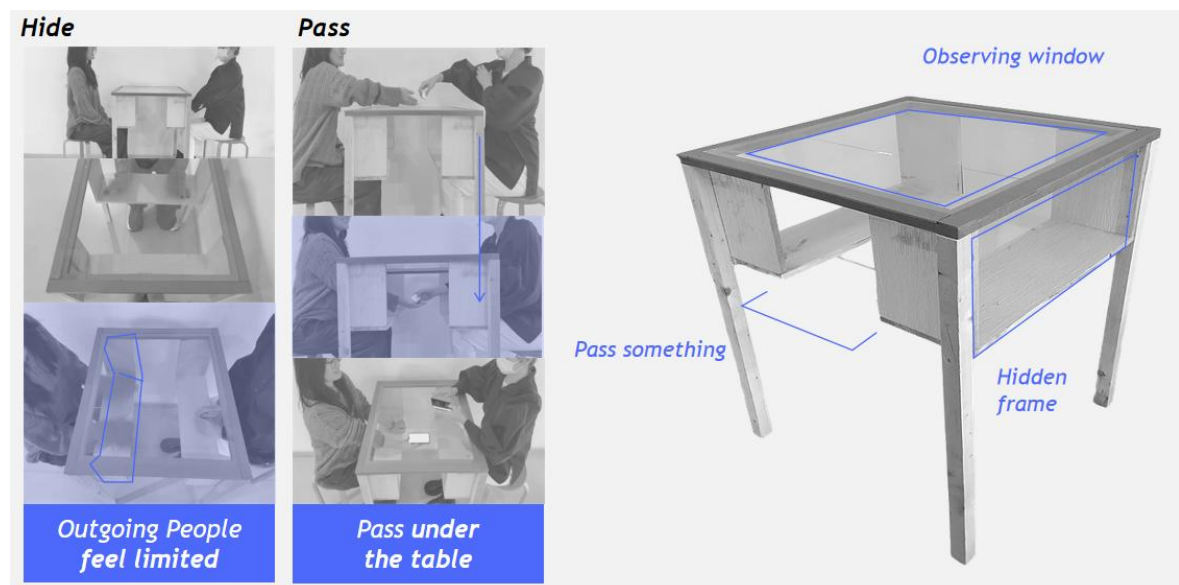


Fig. 4.5.2: Findings from table

4.6 Design Part 3: Lamp Design

4.6.1 Concept Generation

Given that the shy behavior associated with the lamp is related to eye contact and sound, Arduino technology was considered during the initial design to integrate visual and auditory signals into the physical lighting fixture. In Concept 1, there were lamps with covered fabric placed on the seats of both shy and outgoing people. When one party spoke, the light bulb on the other party's head would illuminate, indicating a visible intent to communicate. The fabric surrounding the bulb created a discreet space for communication. However, this design lacked intuitiveness and indirectness in appearance, failing to evoke an immediate association with a lamp. Moreover, the fabric around the head somewhat hindered environmental observation and communication, disconnecting the furniture from its surroundings.

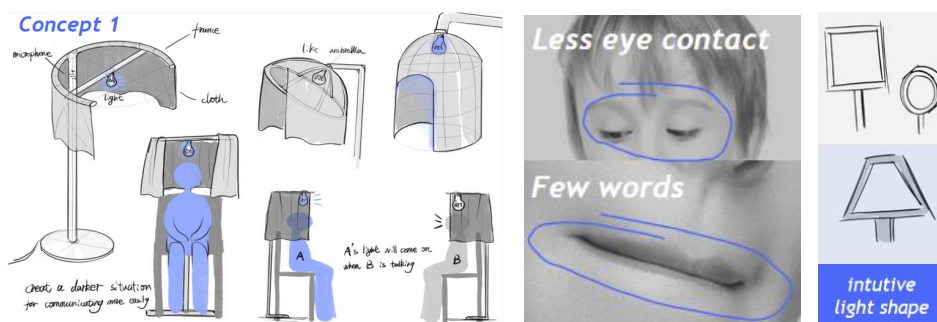


Fig. 4.6.1-1: Concept 1 of Lamp

Therefore, Concept 2 (Fig. 4.6.1-2) shifted towards a shared lamp for both individuals. When engaged in conversation, the lamp would illuminate based on sound, casting light on the faces of both shy and outgoing people. This auditory-to-visual transition made communication intent visible. When the conversation ceased, the cessation of sound signals caused the light to extinguish, allowing for a more comfortable transition into a conversation. In dimmer environments, where facial expressions and body language are less discernible, this anonymity promotes relaxation and a greater willingness to share thoughts and emotions. To enhance intuitiveness and simplicity in appearance, the lamp's design references the most common and classic lamp shapes, transforming the cylindrical form into a two-dimensional trapezoid for a more streamlined aesthetic.

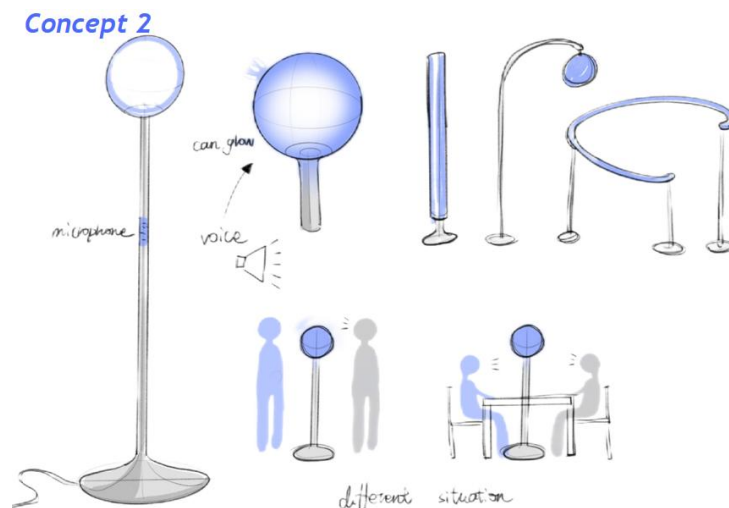


Fig. 4.6.1-2: Concept 2 of Lamp

4.6.2 User Test, Problem & Finding

Initially, to determine the specific dimensions of the lamp, participants were instructed to engage in brief conversations with lamps of varying heights. Feedback indicated optimal user response when the lamp's height closely matched the participants' face height. This height alignment minimized shadows on the faces, creating softer facial features and inducing relaxation.

Additionally, the proximity of the microphone at this height ensured a more stable reception of sound signals. Furthermore, researcher observed that this integration of auditory and visual information sparked curiosity in both outgoing and shy individuals, directing their attention more towards the lamp and less towards facial expressions and eye contact.

However, the current model, utilizing only one microphone to control an LED strip, fails to capture differences in speech and perception between outgoing and shy individuals, lacking the ability to discern their communication intent. Participants also noted in feedback that the LED's abrupt and short-lived brightness changes were perceived as "too intense and conspicuous."

Corresponding solutions:

1. Employing two microphones to separately control LED strips for shy and outgoing individuals.
2. Gradual illumination of individual bulbs in the LED strip, progressively brightening and slowly dimming in the absence of sound signals.

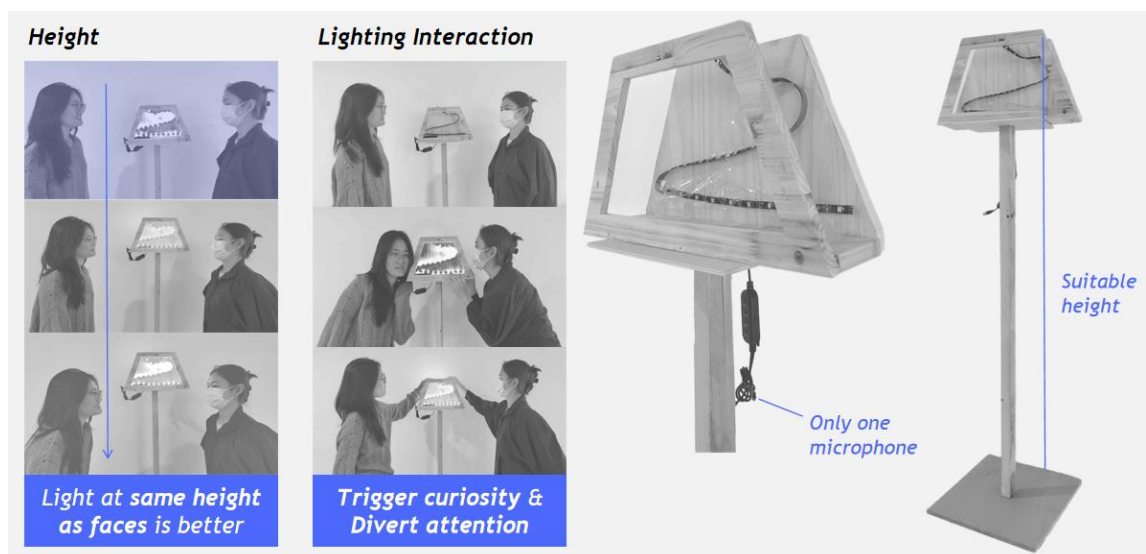


Fig. 4.6.2: Findings from Lamp

4.7 Final Outcomes

The furniture produced in this design project is intended to be an experimental installation rather than a mass-produced product. Therefore, its application scenarios will be more focused on exploring the realms of shy perception and fostering new dialogues. The ideal usage environment for this installation is associated with interactive exhibitions, street interactions, or social experiments, aiming to provide an interactive platform and evoke a reevaluation of awareness surrounding shyness.

4.7.1 Final Concepts

For Chair: The final designs of the three furniture types incorporate solutions guided by concept generation. About the paired chairs (Fig. 4.7.1-1), only the chair on the side of shy people is movable, while the chair on the side of outgoing people is connected to two bars at the bottom, making it difficult for them to move the chair. When shy people want to be further or closer to the other people, they need to lift chair and insert the tenon structure at the bottom of the chair into the new holes on the two bars to achieve a change in distance.

As individuals are aware of the specific distance they wish to maintain with others, they are unlikely to move the chair once seated and adjusted to the appropriate distance. Therefore, in the chair design, providing the functionality for shy people to move is primarily to offer them the opportunity to adjust their social distance initially. The tenon structure, which is not easily movable, was chosen as the means of adjustment.

During the model fabrication, two possible forms of the tenon structure for the chair legs, labeled as 'a' and 'b,' were identified. After evaluation, the researcher selected the 'a' form for several reasons: it is more robust and less prone to breakage, and the manufacturing process for the 'a' structure is simpler, potentially improving efficiency in cases where industrial production is feasible.

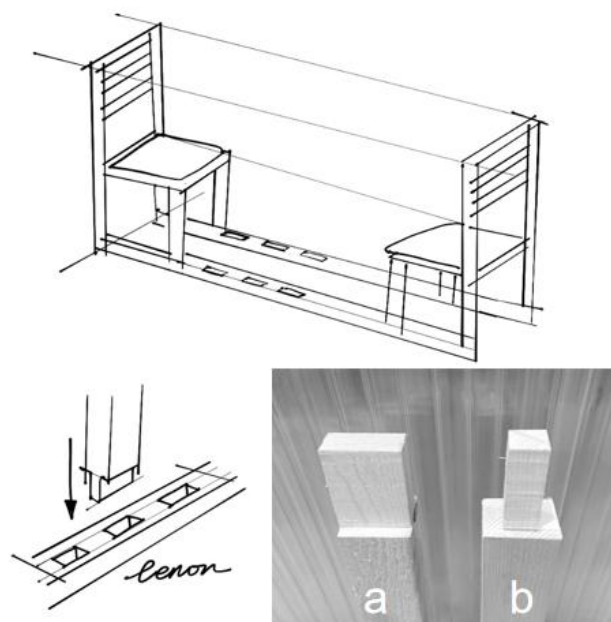


Fig. 4.7.1-1: Final design of chair

For Table: Secondly, the material for the hide frame of the table will transition from wood to a more integrated and pliable substance (Fig. 4.7.1-2). Additionally, a symbolic bridge, representing the connection between the two parties, will be incorporated in the middle to enhance visual cohesion between them. The transparent acrylic panel placed centrally on the tabletop restricts shy people and outgoing people to only partially observe the situation beneath the table. With reduced visibility under the tabletop, when both parties engage in the exchange of items, they will begin to experiment with fumbling or speculating about the location of each other's hands, thereby introducing a more discreet dimension to the act of passing objects.

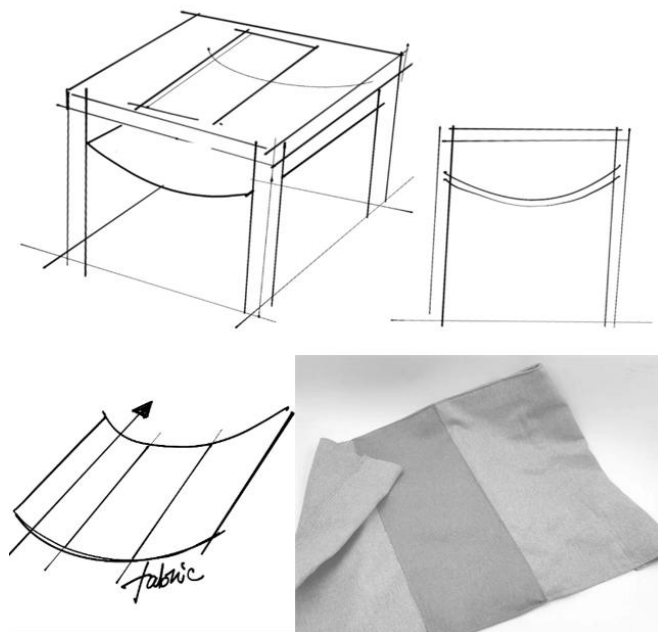


Fig. 4.7.1-2: Final design of table

For Lamp: Thirdly, in the desk lamp (Fig. 4.7.1-3), two microphones are employed to separately control the two LED strips for shy people and outgoing people. Notably, the LED strip for shy people lights up more quickly when receiving sound signals at the same time, whereas the LED strip for outgoing people illuminates more slowly. This implies that the LED strip for shy people may fully light up even if they only speak for three seconds, while outgoing people might need to continue speaking for ten seconds to make the LED desk lamp fully illuminate. This differing pace combines with the brief nature of shy people's speech, aiming to transparently manifest the shared communicative intent beneath the distinct behaviors of both parties.

For signal reception and conversion, an Arduino motherboard, sound sensors, and programmable LED strips are utilized to achieve electronic functionalities. In Arduino IDE programming, the speech captured by the sound sensor is transformed into audio signals, controlling the illumination of the LED based on the presence or absence of sound signals. Simultaneously, the delay effect is employed to enable the gradual brightening and dimming of the LED, introducing the functionality of varying rates.

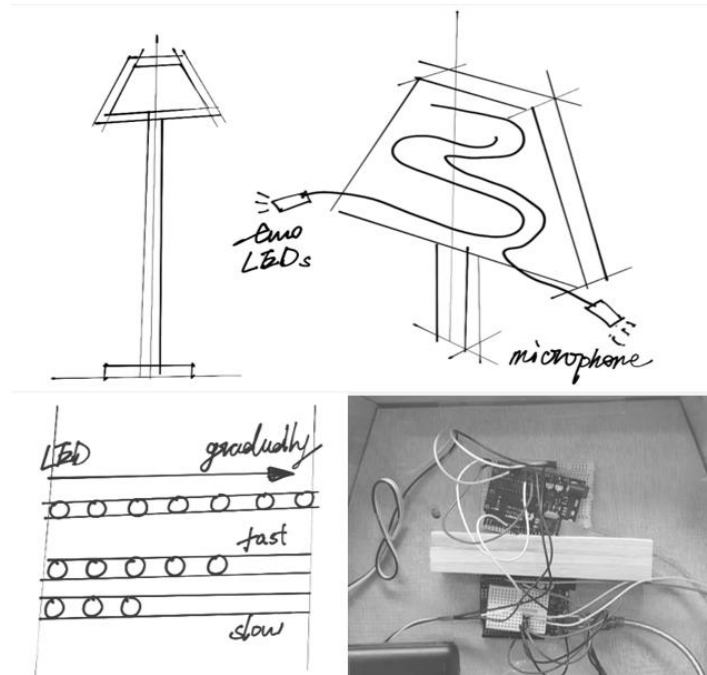


Fig. 4.7.1-3: Final design of lamp

4.7.2 CMF Study

After collecting and analyzing responses from 15 participants on how shyness is described in terms of materials and colors, researcher observed that the majority associated shyness with traits manifested in materials leaning towards softness and roughness (Fig. 4.7.2-1). Natural materials such as linen, wood, and clay were frequently chosen. To mitigate the potential disconnect arising from a disparity between tactile sensations and visual form, canvas, wood, and frosted acrylic were selected as materials for the final model.

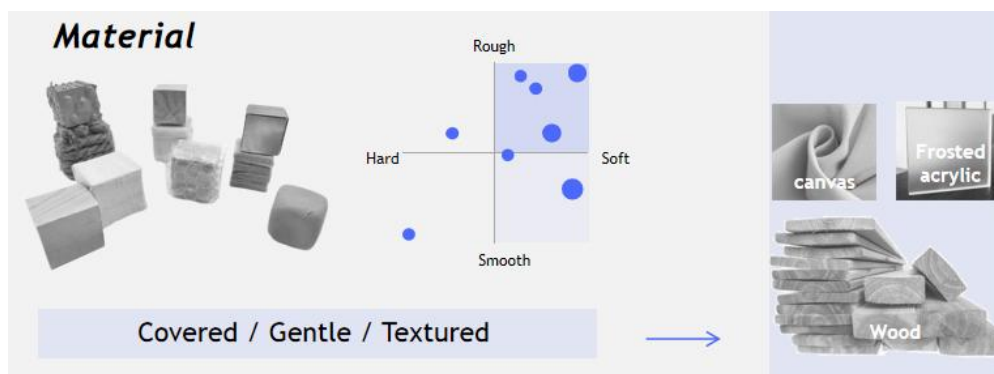


Fig. 4.7.2-1: Analysis and selection of materials

Similarly, participants often opted for low saturation, neutral, or cool-toned colors to express shyness (Fig. 4.7.2-2). Therefore, considering color coordination and perceptual aspects, these four low-saturation colors were employed to articulate the shyness in the final design concerning color and visual information.

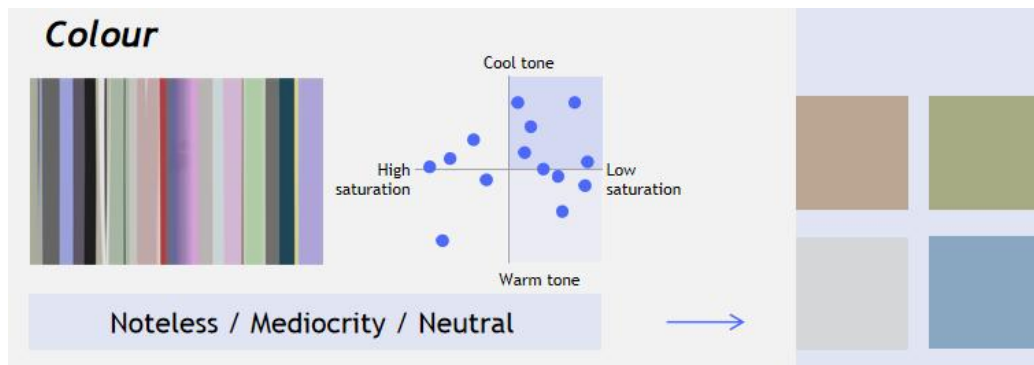


Fig. 4.7.2-2: Analysis and selection of color

To convey the distinction between this furniture set and conventional furnishings, emphasizing its connection to shyness, a predominantly neutral color scheme centered around gray was employed. Within this palette, three specific colors were strategically chosen to highlight unusual elements – the crossbar of the chair, the bridge connecting the frame, and the light influenced by sound. These three colors serve as visual cues (Fig. 4.7.2-3), directing attention to distinctive features that signify the intersection of shyness and design innovation.



Fig. 4.7.2-3: Color as hints on furniture

4.7.3 Final Rendering

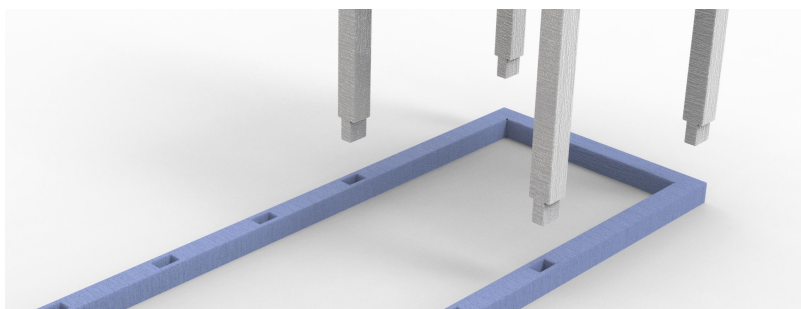
The rendered images simulate an idealized representation of the design outcomes, capturing the envisioned results, structures, and details. The overall design style portrayed in these visualizations serves as a reference for naming this furniture set.



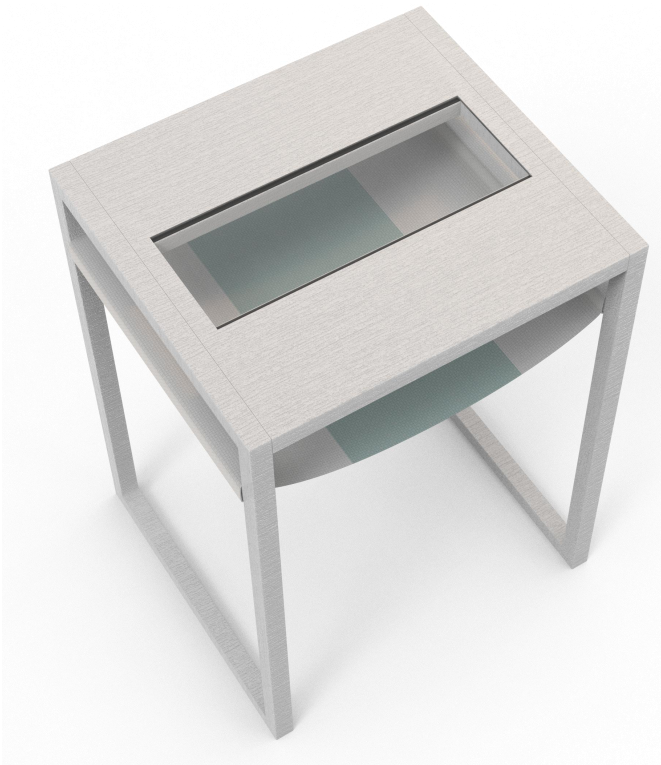
The entire furniture set is conceived as a configuration for usage within specific placements and scenarios, denoted by the acronym S-H-Y. The initials S, H, and Y are derived from the first letters of the names of the three furniture pieces: Shelter, Hideaway, and Yelling, respectively.



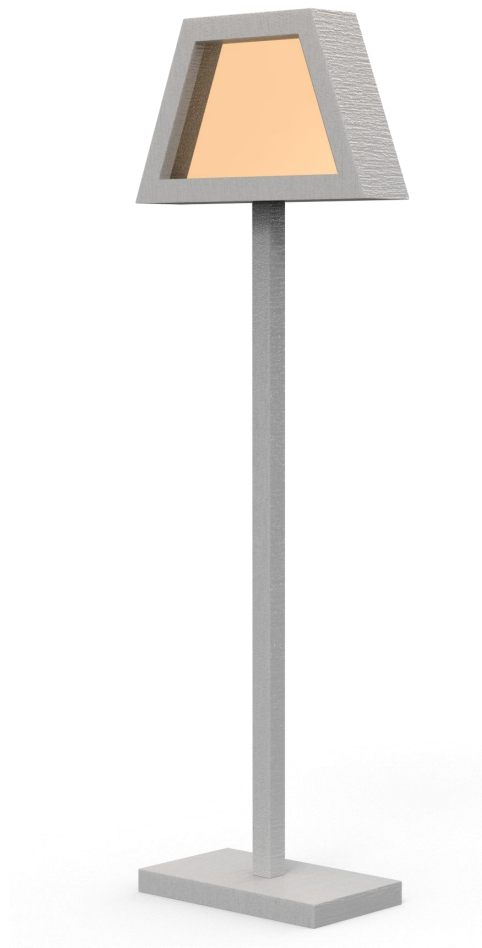
The name "Shelter" for the chair represents the blue connecting bar between the two chairs, serving as a sanctuary for shy individuals to maintain their social distance.



Chair legs and moving details.



The name "Hideaway" for the table signifies a place of concealment, where actions involving hands or the passing of objects are discreet. The term "way" conveys the green pathway that connects both sides.



"Yelling" signifies a more intense, primal form of communication, concurrently showcasing the combined functionality of light and sound.

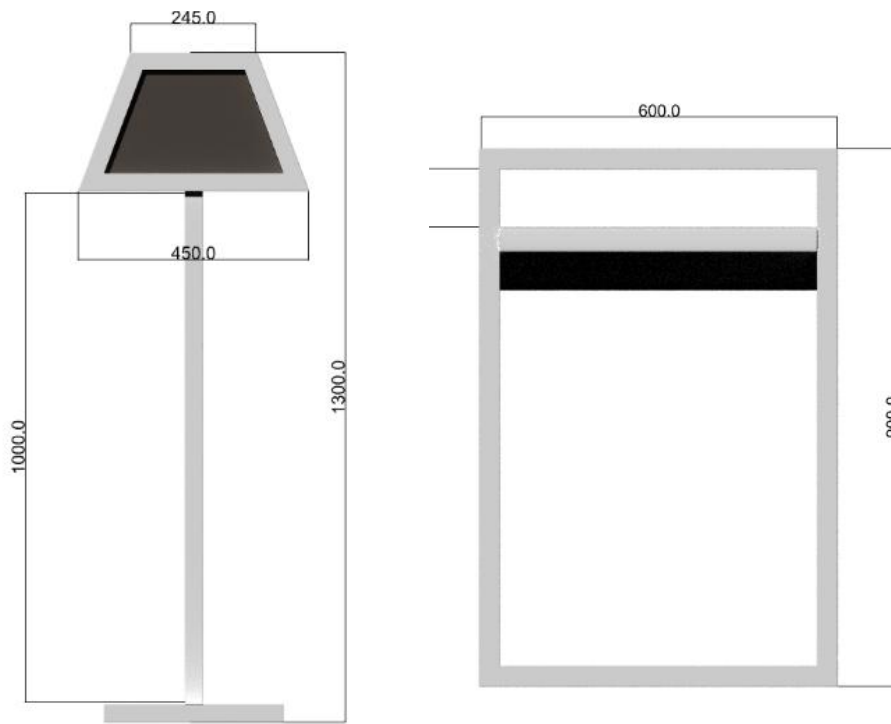
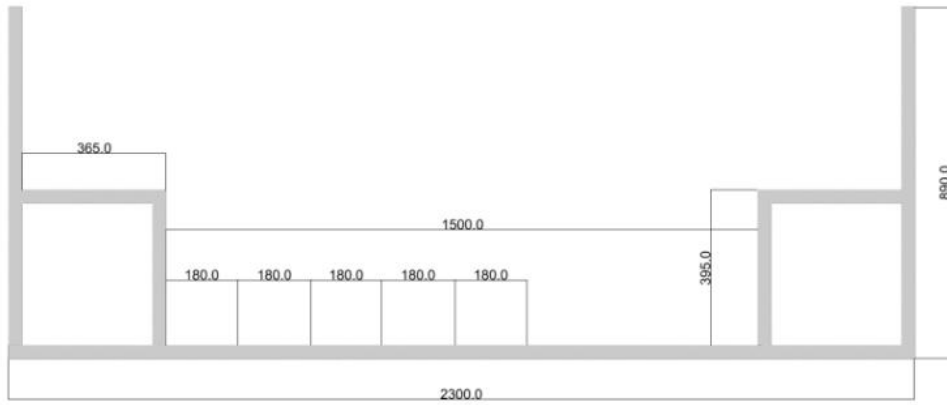


Fig. 4.7.3: Size of real model

4.7.4 Final Models

In the actual model construction, a combination of carpenter's glue and screws was employed to enhance structural integrity. However, due to the unsightly holes created by screws at the joints, drawing attention away from the aesthetics of the furniture, wood filler was applied to fill the holes after assembling the various components. Subsequently, the filled areas were sanded and painted to achieve a seamless finish.

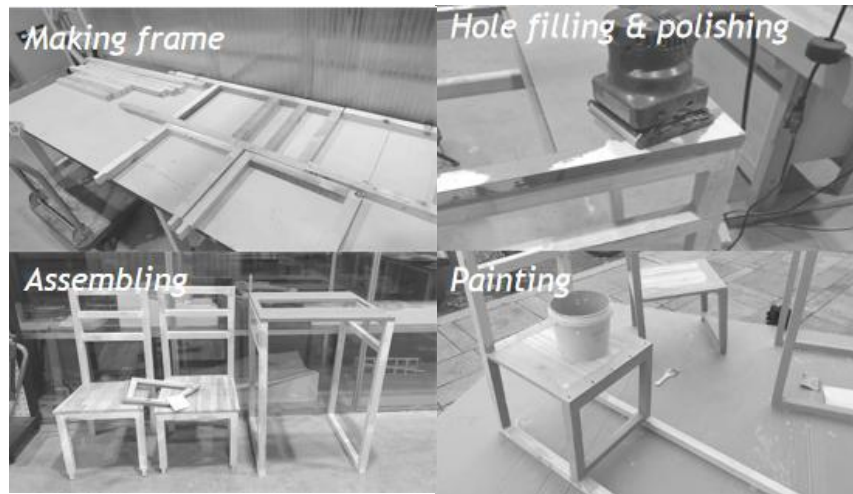


Fig. 4.7.4-1: Process of model making



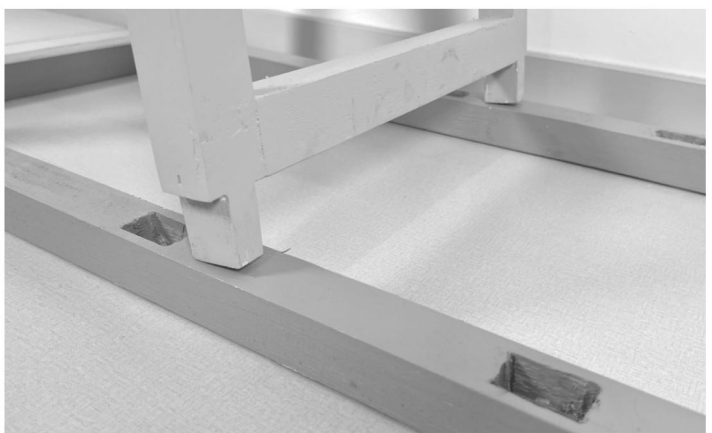


Fig. 4.7.4-2: Details of final design

4.7.5 Exhibition

To enhance public understanding and awareness of shyness in this experimental project, the entire exhibition is divided into three components: furniture introduction cards, 1-minute videos, and interactive activities.

Introduction cards for the three pieces of furniture are individually designed to emphasize their unique characteristics, presenting the design concepts in the voice of each piece of furniture (Fig. 4.7.5-1). Positioned conspicuously on the right side of each card is a prominent triangle, prompting them to pull out the cards for further reading. The researcher, by intentionally making the introduction cards less overt, simulating shy behavior, aims to stimulate curiosity among viewers.

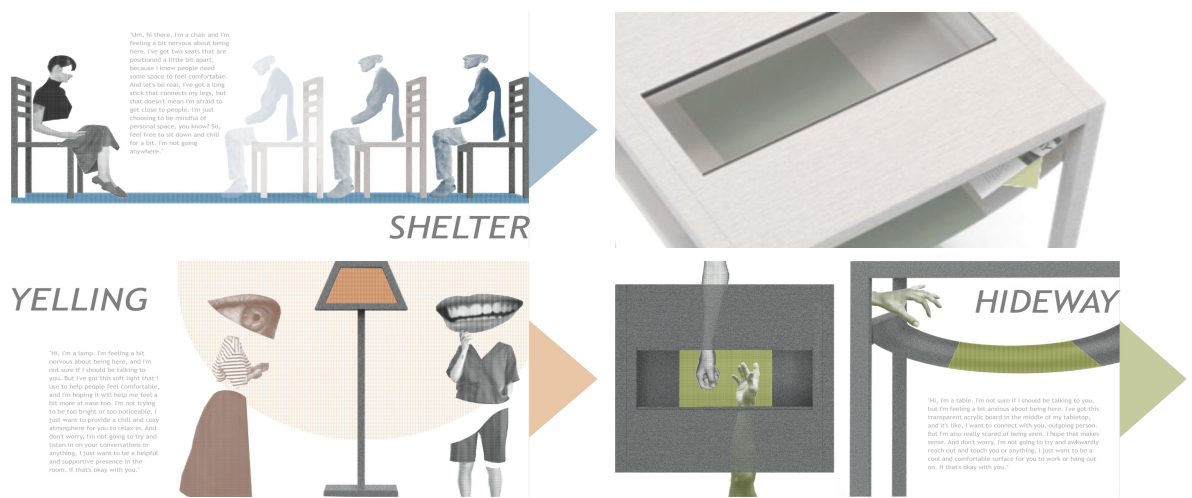


Fig. 4.7.5-1: Introduction cards

The 1-minute video showcases the social challenges faced by shy people due to their behavior, providing a detailed portrayal of scenarios involving both shy and outgoing individuals utilizing the three different pieces of furniture.

https://www.bilibili.com/video/BV1jK41187RB/?spm_id_from=333.999.0.0&vd_source=34b8aff6fd19153990be209f7d3dc5be



Fig. 4.7.5-2: Screenshots of video

In the exhibition, the set of furniture produced by this project is displayed in the gallery, allowing people to interact freely with it and collectively experience the "new dialogue" created by the project. This aims to provoke their reflections and perceptions regarding shyness.



Fig. 4.7.5-3: Details of exhibition

Chapter 5. Conclusion & Reflection

5.1 Conclusion

This dissertation explores the potential for furniture design to facilitate improved social experiences between shy and outgoing people. Shyness is often misunderstood and stigmatized in society, leading to unequal social relationships and reduced social experiences. The research aims to create new dialogues mediated through thoughtfully designed furniture to enhance two-way understanding.

The literature review analyzes definitions of shyness and current research gaps, especially regarding the relationships between people, behaviors, and objects. The methodology utilizes reflective practice and iterative tests to study perceptions, interpretations, and modes of communication.

Initial tests reveal outgoing people overlook many shy behaviors and misinterpret others, while shy people view the same behaviors as tension-easing mechanisms. Additional tests using colored boards find objects can aid self-expression for shy people and assist outgoing people in more nuanced understanding. However, some interpretation differences remain. These findings inform the furniture-behavior correspondences in the design phase. Chairs embody the shy behavior of “keeping distance.” Tables, as social focal points, integrate the behavior of “hiding body parts.” Lamps’ localized lighting relates to shy people’s “lack of eye contact” and “speaking less.”

The research questions were:

- 1. Is it possible to build new dialogues that can improve two-way social experiences between shy people and outgoing people?**

Yes, the thesis demonstrates that thoughtfully designed furniture can effectively facilitate new forms of non-verbal communication and interaction. The furniture serves as mediators, allowing shy people more freedom of expression while guiding outgoing people towards more understanding.

- 2. Is it possible to ensure outgoing people understand shy people more effectively?**

Yes, the tests reveal that purposefully designed furniture can assist outgoing people in comprehending shy behaviors more accurately by shifting interpretations from person-focused to object-focused. The designs disrupt norms to provoke reassessments of biases.

3. Is it possible to influence outgoing people's perception of shy people?

Yes, altering habitual social furniture to manifest shy traits materializes intangible behaviors, prompting outgoing people to reflect on their inherent assumptions and interpretations. The unfamiliar interactions challenge prevailing social norms dependent on outgoingness.

Through models and user testing, the final designs balance intuitive aesthetics and unexpected interactions. The series reimagines conventional furniture by materializing shy traits, aiming to provoke reflection on social biases.

In conclusion, the research effectively employs design to build new dialogues - not just between shy and outgoing individuals but also between people and their everyday objects, which enhancing two-way social experiences of people. The tests demonstrate outgoing people can be guided to understand shy people's behaviors more comprehensively through purposefully designed furniture. Additionally, the furniture mediates communication indirectly, allowing shy people freer self-expression. The dissertation proposes insightful possibilities for human-object interactions to improve interpersonal relationships. Further explorations can substantiate these behavior-furnishing connections towards meaningful applications.

5.2 Reflection

A key limitation of this research is the small, homogeneous sample of participants for the observational studies and design testing. Only eight participants were recruited for the initial shyness scale screening and user studies. All were students from the same university program and cultural background. A larger and more diverse group would provide more varied insights and enhance the credibility and generalizability of the findings.

Additionally, the number of studies conducted was quite restricted, consisting only of two key perception tests with a total of ten participants. To substantiate the analysis on links between human behavior, personality, and physical objects, more extensive testing through various methods is needed. Potential approaches could include surveys, focus groups, ethnographic observation, and field studies in multiple social contexts.

Regarding concept development and the design process, further iteration and broader exploration of possibilities would be beneficial. The existing concepts went through initial rounds of user feedback and refinement but would benefit from validation across more user groups. Envisioning radically different directions beyond the incremental changes proposed may also uncover new opportunities.

Additionally, the final furniture designs have potential for improvement in simplicity, intuitiveness, and integration with existing environments. For instance, the distance-enforcing chairs could utilize more subtle visual cues to suggest their purpose, rather than an obtrusive horizontal bar. Enhanced integration of the behavioral traits into ergonomic and aesthetic furniture qualities would enable more seamless adoption.

In summary, expanding the diversity and quantity of participants, studies, contexts, and concepts would strengthen the research and outcomes. Regardless, this dissertation offers a thoughtful foundation and novel direction for human-centered design and furniture to positively impact social psychology. The proposed new dialogue between personality, behavior, and everyday objects hints at rich possibilities for further investigation.

5.3 Further Direction

The experimental devices produced at this juncture, while the culmination of numerous testing iterations, have yet to undergo extensive examination within authentic social contexts due to the compressed timeframe. Consequently, it is imperative to delineate a comprehensive roadmap for future endeavors:

User Engagement and Field Testing:

Future plans involve conducting extensive user testing in diverse social environments to gauge the practical efficacy of the designed furniture. Real-world scenarios will provide invaluable insights into the adaptability and effectiveness of the devices in facilitating communication between shy and outgoing individuals. This phase aims to ensure that the furniture functions seamlessly within the complexity of dynamic social interactions.

Iterative Refinement and Optimization:

Following user feedback and insights gleaned from field testing, an iterative refinement process will be instituted. This entails a meticulous revision of the furniture design, addressing any identified shortcomings or areas for improvement. The goal is to enhance the functionality, comfort, and overall user experience, thereby advancing the project's effectiveness in dismantling stereotypes and promoting meaningful communication.

Long-Term Impact Assessment:

A longitudinal study will be initiated to assess the long-term impact of the designed furniture on fostering improved communication between individuals of varying social dispositions. This involves tracking user experiences and societal perceptions over an extended period to determine the sustained effectiveness of the project in challenging and transforming pre-existing stereotypes associated with shyness.

Bibliography

- Bigham, J. P., Jayant, C., Ji, H., Little, G., Miller, A., Miller, R. C., Miller, R., Tatarowicz, A., White, B., White, S., & Yeh, T. (2010). VizWiz: Nearly Real-time Answers to Visual Questions. *Proceedings of the 23rd Annual ACM Symposium on User Interface Software and Technology*. <https://doi.org/10.1145/1866029.1866080>
- Buss, A. H. (1995). *Personality: Temperament, Social Behavior, and the Self*. Allyn & Bacon.
- Cain, S. (2012). 'Quiet: The Power of Introverts in a World That Can't Stop Talking'. New York, NY: Crown Publishing Group.
- Carducci, B.J. (2012). Shyness: A Bold New Approach. New York, NY: Harper Perennial.
- Carducci, B. J. (2013). Shyness. *The Encyclopedia of Cross-Cultural Psychology*, 3, 1176–1179. <https://doi.org/10.1002/9781118339893.wbeccp492>
- Carducci, B. J., & Conkright, K. C. (2020). Shyness. *The Wiley Encyclopedia of Personality and Individual Differences*, 417–421. <https://doi.org/10.1002/9781119547174.ch248>
- Cheek, J. M., & Buss, A. H. (1981). Shyness and sociability. *Journal of Personality and Social Psychology*, 41(2), 330–339. <https://doi.org/10.1037/0022-3514.41.2.330>
- Cheek, J. M., & Melchior, L. A. (1990). Shyness, Self-Esteem, and Self-Consciousness. *Handbook of Social and Evaluation Anxiety*, 47–82. https://doi.org/10.1007/978-1-4899-2504-6_3
- Crozier, W. R. (2014). 'Children's Shyness: A Suitable Case for Treatment?'. *Educational Psychology in Practice*, 30(2), 156–166. [doi: 10.1080/02667363.2014.895934]
- Evans, G. W. and Wener, R. E. (2007). 'Crowding and Personal Space Invasion on the Train: Please Don't Make Me Sit in the Middle'. *Journal of Environmental Psychology*, 27(1), pp.90-94.
- Finch, J. (2019). *Shy or socially anxious?* [online] Centre for Clinical Psychology Melbourne. Available at: <https://ccp.net.au/shy-or-socially-anxious/> [Accessed 22 Dec. 2023].
- Foley, F. W., Heath, R. F., & Chabot, D. R. (1986). Shyness and defensive style. *Psychological Reports*, 58(3), 967–973. <https://doi.org/10.2466/pr0.1986.58.3.967>
- Freeman, S.F.N. and Kasari, C. (2002). 'Characteristics and Qualities of the Play Dates of Children with Down Syndrome: Emerging or True Friendships?'. *American Journal on Mental Retardation*, 107(1), pp.16-31.
- Gohil, A. (2020c). inVisible: a guide to understanding & designing for introverts. *Masters Theses*. [online] Available at: <https://digitalcommons.risd.edu/masterstheses/567/>
- Gough, H. G., & Thorne, A. (1986). Positive, Negative, and Balanced Shyness. *Shyness*, 205–225.

https://doi.org/10.1007/978-1-4899-0525-3_16

Guideline Development Group et al. (2013). 'GUIDELINES: Recognition, assessment. and treatment of social anxiety disorder: summary of NICE guidance'. *BMJ: British Medical Journal*, 346(7910), pp. 34–35. Available at: Link (Accessed: 21 December 2023).

Haegele, J.A. and Hodge, S. (2016). 'Disability Discourse: Overview and Critiques of the Medical and Social Models'. *Quest*, 68(2), pp.193-206.

Heiser, N.A., Turner, S.M., & Beidel, D.C. (2003). Shyness: Relationship to social phobia and other psychiatric disorders. *Behaviour Research and Therapy*, 41(2), 209-221.

Heitz, D. (2013, December 3). *What You Should Know About Shyness*. Healthline; Healthline Media.
<https://www.healthline.com/health/shyness>

Henderson, L. (2014). *Helping Your Shy and Socially Anxious Client*. New Harbinger Publications.

Henderson, L., & Zimbardo, P. (2001). Shyness as a Clinical Condition: The Stanford Model. In W. R. Crozier, & L. E. Alden (Eds.), *International Handbook of Social Anxiety: Concepts, Research and Interventions Relating to the Self and Shyness* (p. 431-447).

Henderson, L., & Zimbardo, P. (2010). Shyness, Social Anxiety, and Social Anxiety Disorder. *Social Anxiety*, 65–92.
<https://doi.org/10.1016/b978-0-12-375096-9.00003-1>

HLJ (2014) napkin portable dining table for two encourages friends to eat together. Available at:
<https://www.designboom.com/design/napkin-portable-dining-table-for-two-05-23-2014> (Accessed 23 September 2023).

Hofstede, G. (1984). *Culture's consequences: International Differences in work-related Values*. Sage Publications.

HOSODA, M., STONE-ROMERO, E. F., & COATS, G. (2003). THE EFFECTS OF PHYSICAL ATTRACTIVENESS ON JOB-RELATED OUTCOMES: A META-ANALYSIS OF EXPERIMENTAL STUDIES. *Personnel Psychology*, 56(2), 431–462. <https://doi.org/10.1111/j.1744-6570.2003.tb00157.x>

Jiang, J., Borowiak, K., Tudge, L., Otto, C., & von Kriegstein, K. (2016). Neural mechanisms of eye contact when listening to another person talking. *Social Cognitive and Affective Neuroscience*, 12(2), nsw127.
<https://doi.org/10.1093/scan/nsw127>

Jones, M. G., & Gerig, T. M. (1994). Silent Sixth-Grade Students: Characteristics, Achievement, and Teacher Expectations. *The Elementary School Journal*, 95(2), 169–182. <https://doi.org/10.1086/461797>

Jones, W. H., Cheek, J. M., & Briggs, S. R. (1986). *Shyness*. Emotions, Personality, and Psychotherapy.

Kingsbury, S.J. (2009). The effects of exercise training on psychological well-being for individuals with schizophrenia: A systematic review. *British Journal of Wellbeing*, 2(1), 9-17.

- Kurtz, J. E., & Tiegreen, S. B. (2005). Matters of Conscience and Conscientiousness: The Place of Ego Development in the Five-Factor Model. *Journal of Personality Assessment*, 85(3), 312–317.
https://doi.org/10.1207/s15327752jpa8503_07
- Leary, M. R., & Kowalski, R. M. (1995). *Social anxiety*. Guilford Press.
- Lane, C. (2008a). *Shyness: How normal behavior became a sickness*. Yale University Press.
- Mehrabian, A. (1976). *Public Spaces and Private Spaces: The Psychology of Work, Play, and Living Environments*. New York, NY: Basic Books.
- Prisbell, M. (1988). Perception differences and levels of shyness. *Communication Research Reports*, 5(2), pp.197–203.
doi: <https://doi.org/10.1080/08824098809359824>
- Rubin, K. H., Burgess, K. B., Kennedy, A. E., & Stewart, S. L. (2003). Social withdrawal in childhood. In E. J. Mash & R. A. Barkley (Eds.), *Child psychopathology* (pp. 372–406). The Guilford Press.
- Scott, S. (2007). *Shyness and Society: The Illusion of Competence*. London: Palgrave Macmillan UK.
- Saffron Woodcraft, Hackett, T., & Caistor-Arendar, L. (2011). *Design for Social Sustainability*.
- Sherman, C. (2020, October). *Shyness (for Teens) - Nemours KidsHealth*. Kidshealth.org.
<https://kidshealth.org/en/teens/shyness.html>
- Singh, A., & Singh, R. (2017). Effect of type of schooling and gender on sociability and shyness among students. *Industrial Psychiatry Journal*, 26(1), 77. https://doi.org/10.4103/ipj.ipj_25_14
- Turner, T. (2016) WEATHER OR NOT. Available at: <https://www.yankodesign.com/2016/06/30/weather-or-not>
(Accessed 23 September 2023).
- W. Ray Crozier. (2000). *Shyness: Development, Consolidation and Change*. Routledge.
- X. Ray Crozier. (2001). *Understanding Shyness: Psychological Perspectives*. MacMillan.
- Zimbardo, P., Pilkonis, P. and Norwood, R.M. (1975). 'The Silent Prison of Shyness'. In: W. Ray and S. Briñol, eds. *Social Psychology: Sociological Perspectives*. Cambridge, UK: Cambridge University Press. pp.228-245.
- Zimbardo, P. G. (1977). *Shyness. What It is What to Do About It* . Addison Wesley Publishing Company.
- Zimbardo, P. G. (2007). *The Lucifer effect : how good people turn evil*. Rider.