

IV Results and Discussion

The previous chapter consisted in explaining the limitations, the materials developed for the study as well as how the data was collected and analyzed. This chapter provides the results of this investigation, which were obtained by following the previously explained methodology. This section consists of three main parts. Through the first part of this chapter, the results of the study are shown and an analysis and discussion of the differences between the results of the control group and the clinical group are explained. A comparison between the results of the clinical group results concerning the SPs and the NSPs is drawn as well. The second section compares the results of the study with previous findings about how communicative competence is affected after a closed-head injury by doing research with linguistic communication; consequently, it also contains a discussion of if human communicative competence should be considered as a mental cognitive process rather than a language feature. In addition, and more importantly, this section also includes a discussion about which variables may create a difference within which variables may create a difference within results between using extra-linguistic communication and using linguistic communication. Finally, the third section of this chapter will consist of a comparison between the present study and the original study, which was replicated (Bara et al., 2001). In this subsection not only will the results be compared, but the differences between the researches' results also will be discussed in terms of language and culture as variables. This last will be a change from the original study to this replication.

4.1 Standard paths and non-standard paths

As mentioned in Chapter 2, the SP consist of five inferential phases that need to be followed from the moment the utterance or communicative action is received to the moment a response is given. These inferential phases are:

1. Understanding the expressive meaning of the act
2. Understanding the actor's meaning
3. Generating a communicative effect
4. Generating a reaction
5. Generating a response

In this case one of the inferences resulting of an inferential phase is considered non-true or non-accordant to reality, the SP is blocked and a NSP is taken. The cognitive apparatus behind the conversation game works in two levels. The base-level is composed of the inferences drawn by following the phases of the paths. A second level called the meta-level has the function of checking the correct functioning of every inferential phase. It also controls the shift from one phase to the other and decides what should be done if a phase gets blocked.

This section of this chapter is concerned with the results obtained from the study's task. It is divided into four sub-sections (standard path, deceit, irony and failure). Each of these sub-sections consists of a comparison between the control group results and the clinical group results for the corresponding communicative

action(s) of the particular sub-section. For illustrating the results obtained for this section a table has been provided (Table 1) at the end of the section.

4.1.1 The standard path (SP)

For this study, the number of participants needs to be taken under consideration. The control group was conformed of two participants as well as the clinical group, the results obtained from this study may not be considered representative of the population. Consequently, the results may be considered a case study. A statistic comparison between the results from Bara et al.'s (2001) original study and this replication was not possible due to the difference between the number of participants of the original study (30) and this replication (4).

Table 1: Table of the results of the closed-head injured participants and the control group for the study's task

Communicative Action	Control Group's percentage of correct answers	Clinical group's percentage of correct answers
Successful simple	6/6 (100%)	5/6 (83.3%)
Successful complex	6/6 (100%)	5/6 (83.3%)
Successful deceit	6/6 (100%)	4/6 (66.7%)
Successful irony	6/6 (100%)	2/6 (33.3%)
Failure of communication	8/8 (100%)	4/8 (50%)

The results of the videos concerning the SP illustrated in Table 1, show that the control group did very well recognizing which was the communicative intention

concerning the simple successful standard path communicative action. The control group as a whole had 6/6 (100%) right answers for this communicative action. On the other hand, the clinical group had lower results having 5/6 (83.3%) right answers as a whole for this case, which is could be considered very high; but a more representative population would be needed to corroborate such a claim. For the complex successful standard path communicative action, the results are the same that for the simple standard path. The control group rated 6/6 (100%) right answers while the clinical group rated 5/6 (83.3%) right answers. In this case, a decrease of the ability of comprehending the communicative action is perceptible. Vicente, who was a participant of the clinical group, had one mistake for the simple communicative action scenes, but no mistakes for the complex communicative action scenes. On the other hand Liliana, who is the other participant of the clinical group, had one mistake for the complex communicative action scenes but no mistakes for the simple communicative action scenes. Consequently, no tendency can be detected concerning the difficulty between comprehending a simple SP and a complex SP for the clinical group. This can be explained by considering that a complex successful standard path is equivalent to two or more subsequent simple standard paths; therefore if a person is able to understand a simple successful standard path, she or he will probably be able to understand a sequence of simple successful standard paths. In other words, he or she will be able to understand a complex standard path.

4.1.2 Deceit (NSP)

In the case of successful deceit the participants were no longer challenged by a SP, but by a NSP. In this case as the scenes showed three successful deceits, the participants needed to understand that which was inferred from the communicative action performed by the other actor in the second phase of the conversation game did not correspond to what the actor actually believed or to their mental representations. This means that the meaning inferred by following the SP is contrary to what the character actually believes (which could be understood to be not true- a lie). As a result of understanding the former, the participants needed to block the inference obtained from the second inferential phase and take a NSP. The control group did considerably well recognizing that the character was lying with 6/6 (100%) right answers; however, the clinical group's results were lower compared to the SP with 4/6 (66.7%) of right answers. One error was committed by each one of the participants. Accordingly, as the SP should not be followed in this case, a higher difficulty for understanding the communicative action emerges. The results concerning the clinical group can possibly be explained by considering that the meta-level, which allows us to recognize when the SP should not be followed, is damaged.

4.1.3 Irony (NSP)

In the case of irony, there is an inconsistency in the second phase of the conversation game as well. The main difference between deceit and irony is that the intention of the speaker or performer is that the other person who receives the

information will not follow the standard path. In other words, the receiver will realize that the second phase must be blocked and that the actor intends for him or her to block the second phase of the conversation game and take a NSP. For this case, the scores of the control group were 6/6 (100%) right answers and the clinical group scored 2/6 (33.3%) right answers. The decay in the results of the clinical group can be explained if we consider that, compared to deceit, understanding irony may be a more complicated challenge. Firstly, the participants needed to understand that the meaning inferred from the second phase by following the SP is contrary to what the character actually believes, as they did to recognize a deceit. Consequently, the participants needed to block the inference obtained from the second inferential phase and take a NSP. Secondly, they needed to realize that the first inferential phase of the conversation game also needs to be reconsidered because the nature of the utterance of action involves an extra intention. The person performing the communicative action wanted the receiver to know that the meaning inferred from the second phase did not correspond to what the character actually believed to be true. As a result, the nature of the communicative action needed to be revised. For example, a request may not be a request at all, but an ironic statement.

4.1.4 Failure (SP and NSP)

In the case of the failure of a communicative action (NSP), there was one failure scene for each communicative action. For every scene, the task consisted on understanding that one of the actors in the scene had failed to understand the communicative action. In the four different cases (failure to understand a simple

communicative action, failure to understand a complex communicative action, failure to understand deceit and failure to understand irony) the control group scored 8/8 (100%) right answers and the clinical group had 4/8 (50%) right answers. For the clinical group, understanding that one of the characters had not understood a SP communicative action (complex or simple) was a successful task with 4/4 right answers. However, the clinical group was not able to understand that a character in the scene had failed to understand a NSP communicative action with 0/4 right answers. In other words, recognizing that a person has not understood a communicative action, which followed a NSP is more complex than understanding the NSP communicative action itself, as in the case of successful irony and successful deceit. In the cases of unsuccessful NSP (irony and deceit), the participants not only dealt with the task of recognizing a NSP communicative action, as they had done for successful deceit and successful irony. Additionally, they needed to understand that the reaction of the character receiving the deceit or irony did not correspond to a reaction based on following a NSP. For doing so, several steps must be followed. First, for understanding the communicative action, a NSP must be followed. Following a NSP results on modifying the meaning of the communicative action that has been received (deceit) or modifying the meaning and the nature of the communicative action that has been received (irony). Secondly, for understanding that the receiver of the NSP communicative action has failed to follow the correct NSP, the participant needed to understand that the nature of the receiver's reaction did not correspond to the nature of actor's communicative action or that the meaning of the meaning of the receiver's reaction did not correspond to the meaning of actor's communicative action. For example,

if a child is lying when he says “I ate my salad” then the meaning of the communicative act changes when the receiver realizes it is a lie. The meaning becomes the contrary: I did not eat my salad. As a consequence, the reaction of the receiver has to correspond to this new meaning of not eating the salad. A case in which the reaction would correspond to the new meaning would be not giving pie to the kid. A reaction, which would correspond to the meaning of following a ST (I ate my salad) would be giving the child some pie. In the same way, if the nature of a communicative action or utterance changes because a NSP has been followed, the reaction to that utterance or communicative action needs to correspond to this new nature. For example, if a person says “please, kill me now” the nature of this utterance following a ST would be a request and consequently the receiver may actually kill this person. But, if the irony NSP is followed, then the utterance’s nature changes from a request to a statement and the meaning would change as well. A possible interpretation would be the statement “I am so bored.” And a consequent reaction to that statement could be a sympathetic smile.

As the meta-level has the function controlling the shift from one phase to the other and deciding what should be done if a phase gets blocked, it is this level which is in charge of modifying the meaning or the nature of an utterance or a communicative action by following a NSP. If we assume that the meta-level of the clinical group participants is damaged, then we could explain that they could not match a corresponding reaction to the modified meaning or nature of the NSP communicative action because the meaning and the nature of this communicative

action may not have been modified in the first place. Furthermore, misguided by the second actor's reaction they automatically followed the SP.

The results of this study show that as the task for the meta-level becomes more complex and participants that suffer a closed-head injury find it harder to understand the communicative action. This means that although they are able to follow a SP they are not able to recognize when a NSP must be taken. Additionally, the more complex the task for the meta-level becomes the more difficult it becomes to understand the communicative action by the participants suffering a closed head injury. For them the failure to understand a communicative action increases as follows:

- Understanding that a SP must be taken
- Understanding that a NSP must be taken which changes the meaning of the communicative action
- Understanding that a NSP must be taken which changes the meaning and the nature of the communicative action
- Understanding that a reaction does not correspond to the meaning and/or nature of a SP communicative action
- Understanding that a reaction does not correspond to the meaning of a NSP
- Understanding that a reaction does not correspond to the meaning nor the nature of a NSP

4.2 Linguistic communication vs. extra-linguistic communication

Through this section of the results and discussion, the results obtained from this study using extra-linguistic communication in SPs (complex and simple), and NSPs (deceit, irony and failure) are compared to the results of Bra et al. (1997) obtained from their study using linguistic communication in SPs and NSPs. The features that may contribute to a better understanding of NSPs are explained through this section. A comparative table (Table 2) can be found at the end of this section illustrating the results of Bara et al.'s study (1997) and the present study.

Table 2: Table of the results between Bara et al's study concerning closed-head injured participants using linguistic communication and the present study concerning closed-head injured participants using non-linguistic communication

Communicative Action	Using linguistic communication percentage of correct answers	Using extra-linguistic communication percentage of correct answers
Successful simple	100%	83.3%
Successful complex	94%	83.3%
Successful deceit	75.5%	66.7%
Successful irony	86%	33.3%

4.2.1 Closed-head trauma and different means of communication

In the study performed by Bara et al. (1997) entitled *Neuropragmatics: Neuropsychological constraints on formal theories of dialogue* the authors claim

that the tasks performed in closed-head injured patients concerning a NSP were significantly more complex and had lower results than the ones concerning SPs. The results for this study concerning the closed-head injured participants were 100% right answers for the simple successful standard act, 94% right answers for the complex successful communicative act, 75.5% right answers for successful deceit and 86.4% right answers for irony. This research was performed by using linguistic communication (dialogues). In the case of this study and according to the former results we can see that the same general pattern is followed in the case of extra-linguistic communication as well; the standard path being easier to understand and having higher results than the non-standard path. This would mean that the meta-level of the cognitive processes involved in deciding to take a SP or a NSP is not to be considered linguistic in nature but cognitive because it regulates humans' decisions in choosing which path to follow with or without having linguistic elements involved. In other words, this cognitive process called the conversation game, which as we have shown affects largely a person's communicative competence, involves communication in general whether it is linguistic in nature or extra-linguistic.

4.2.3 *Specific features*

On the other hand, the results obtained using linguistic communication (dialogues) was, in several cases, higher than when using extra-linguistic communication. Although a statics analysis was not developed due to the small number of participants, this shift seems to indicate that, the use of language as a tool for communicating rather than using actions increases the possibilities of success for

closed-head injured people. The reason for this difference can be explained if we regard the differences between linguistic communication and non-linguistic or extra-linguistic communication. The dissimilarity between results does not depend on the participant suffering of a closed-head injury, but in the nature of the tool used for communicating the message. As it was stated before, language has been developed as a tool for facilitating communication amongst human beings. It renders communication easier because it follows certain rules and parameters (morphology, syntax, etc.). In other words, linguistic communication follows a predetermined sequence and structure. This structure can be used as a guideline for closed-head injured people for understanding what the meaning that wants to be communicated is; it contributes with limitations. On the contrary, extra-linguistic communication is not sequential but simultaneous. The subject, the action and the object, as well as the context of the action happen at the same time. For example, if we see a girl kicking a ball, we can see the ball at the same time we see the girl, at the same time we see the action of kicking; all of this happen at the same time. The sequence and guidelines we have when using linguistic communication disappears when we are challenged by extra-linguistic communication.

Consequently, the results of closed-head injured participants can be expected to be lower when using extra-linguistic communication. Language's function is to improve communication, to make it easier for people to communicate. In the case of closed-head injured participants, it is clear that language covers this function because they obtained higher results when using language as the means of communication than when using actions as the means of communication.

4.3 The present study and Bara et al.'s (2001) original study

Through this section, of the results and discussion, the results obtained from this replicated study are compared to the results of the original study performed by Bara et al. (2001) in Torino Italy. Additionally, the linguistic and cultural variables that may explain the differences between the results are explained. A comparative table (Table 3) can be found at the end of this section illustrating the results of Bara et al.'s study (2001) and the present study. This table illustrates the differences between the results of both studies considering the original study and the replication performed throughout this thesis.

Table 3: Table of the results between Bara et al.'s original study (2001) and the present study for closed-head injured participants

Communicative Action	Original study (Bara et al., 2001)	Present study
Successful simple	92%	83.3%
Successful complex	90%	83.3%
Successful deceit	71%	66.7%
Successful irony	44%	33.3%
Failure	56%	50%

4.3.1 Comparison of the results

Firstly, for comparing the original study (Bara et al., 2001) with the replicated study some limitations of the present study need to be considered. One of those limitations was the lack of participants suffering a closed-head injury that the

researcher had access to for performing the replication. While Bara et al. (2001) had 15 participants suffering of a closed head injury and consequently 15 participants for the control group, in the present study, there were only two participants suffering a closed-head injury and two participants for the control group. For doing a valid comparison between the results of both studies the same (or a very approximate) amount of participants would be needed. Furthermore, two participants cannot be judged as a representative population of the population of patients suffering a closed-head injury within the Mexico City area if we consider that the hospital from where the participants were chosen receives an estimated five patients suffering of this condition per week according to the attending doctor of the participants who were part of this study. Even so, by analyzing the differences in the results obtained we can estimate the possible outcomes if a study with more participants was performed. In Bara et al.'s study (2001) the closed-head injured participants had the following percentages of correct answers: 92% for the simple successful communicative action, 90% for the complex successful communicative action, 71% for successful deceits, 44% for successful ironies and 56% for failure. In the present study, the participants suffering of a closed-head injury had the following percentages: 83.3% for the simple successful communicative action, 83.3% for the complex successful communicative action, 66.7% for successful deceits, 33.3% for successful ironies and 50% for failure. As we can see closed-head injured participants of the present study rated lower in every case than from the original study. Most of the results were not strongly different form the original study. The most different results were in the case of irony (44% vs. 33.3%). As previously mentioned, irony is one of the most complex

cases of non-standard communicative action. The most similar results were in the case of deceit (71% vs. 66.7%).

4.3.2 Linguistic and cultural variables

Although this study was performed using extra-linguistic communication language difference was taken under account between these two studies. There were parts of both studies which included linguistic components, which are: explaining the instructions to the participants and the balloons in the photographs. In the case of the instructions, it cannot be said that the language chosen affected the instructions because if this would be true the participants would have scored much lower in all communicative actions and they did significantly well in the standard path communicative actions. In addition, the same instructions were given to the control group which scored 100% right answers in every case. If we compare the results between the original study and the present study considering the different language used for giving the instructions we may find several words that are equivalent in both languages such as:

- Video – video
- Escena – scena
- Ver – guardare
- Fotografía – fotografia
- Escoger - scegliere

In this case, having equivalents from one language to another involves a similarity between these two languages. Equivalents between two languages present the same meaning in both languages represented by different words. For this study, these similarities suggest that, at a meaning or semantic level, there was no variation as a consequence of the language difference.

In addition of having equivalents between both languages, the linguistic structure of Spanish closely resembles the linguistic structure of Italian. Both languages have a flexible syntactic structure with a basis of SVO and both languages are pro-drop. In the case of the instruction in Spanish: “Debe escoger una fotografía de las cuatro. Esa fotografía es la que usted cree que es la correcta. Sólo puede escoger una.” A close morphosyntactic and lexical resemblance can be established with its Italian equivalent “Devi scegliere una fotografia. Questa fotografia é quella che Lei crede che é la corretta. Solo puo scegliere una”. In both cases the conjugation of the third singular person is used for the second person formal conjugation and compound verbs or phrasal verbs are found in which the auxiliary verb is conjugated and the action verb is in infinitive. Additionally, several pronouns are dropped in both cases and the structures of the sentences of both instructions are equivalent. In the case of the photographs the language difference could have affected the results of the present study, but it seems unlikely that it would have majorly affected the communicative actions of irony and not the communicative action of deceit. It is important to acknowledge that Italian and Spanish are very close languages and in the case of the sentences in the balloons, there was only one simple sentence per balloon. As

it was previously mentioned, Italian and Spanish morphologic and syntactic elements as well as lexicon closely resemble each other. In consequence we could expect that the language difference between the original study and the present study used for the instructions and the photographs would not create a difference in the results. In the matter of cultural differences there is much in common between these two cultures as well. According to Hofstede as quoted by McDaniel et al. (2007), Mexico can be described as following:

- High power distance index
- Collectivist
- Masculinity
- High uncertainty avoidance index

On the other hand Hofstede as quoted by McDaniel et al. (2007) considers Italy as following:

- Low power distance index
- Individualism
- Masculinity
- High uncertainty avoidance index

Mexico and Italy have a high masculinity dimension and high uncertainty avoidance index in common, in consequence, these cultures should not be

completely culturally different. Even so, they have very different results concerning power distance index and individualism/collectivism. The differences between the results of the original study and the results of the present study may be evidence of a cultural difference between both countries. For example, as it was mentioned in the previous chapter, the original study used children as actors for the scenes. For the present study, there were no children in any scene. This could have affected the results from one study to the other if the power distance dimension is considered. Although Mexican culture has a higher power distance index than Italy, in the scenes used for the study performed in Mexico City there were no children, this gave the participant fewer cases in which power distance between children and grown-ups could affect the results. In other words, for the present study, power distance as a variable affected less the results than in the case of the Italian original study. Furthermore, as Mexico is a collectivistic country and Italy is an individualistic country, the fact that the participants had to deal with group activities shown in the scenes could also have affected the results. For example, irony (which was the communicative action with more different results between both studies) may be considered a communicative act which requires certain closeness between the actor and the receiver to be performed and understood. In the case of Mexican participants who are part of a collectivistic culture, they could have assumed that the characters in the scenes were part of the same collective group; which brings the characters closer and therefore, irony is natural. This would not be the case for the Italian participants who are part of an individualistic culture. Moreover, the results between both studies were considerably similar; this may be evidence of a close cultural similarity as well. However, as previously

mentioned, a study with a representative population of Mexico's City closed-head injured population would be needed for sustaining this claim.

In conclusion, the difference between the results of the original study by Bara et al. (2001) and the present study do not show a strong effect due to linguistic difference; possibly, a cultural difference between both countries could provide an explanation for the discrepancies between the results of both studies. Overall, the difference between the numbers of participants which were part of each study (four participants for this thesis and 60 participants for the original study), could explain the discrepancy between results. More importantly, a closer comparison between these two studies would require a bigger population of participants suffering of a closed-head injury to be considered valid and reliable. But the results of this comparison have provided a recurrent pattern in the difficulty of closed-head injured patients to understand a communicative action no matter the language or the culture but the use of the meta-level cognitive processes. Further research is needed for sustaining this claim.