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ENGELSKA

Modality in an android's speech

How modal verbs relate to an android's ability to
feel emotions

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Abstract

Title: *Modality in an android's speech – How modal verbs relate to an android's ability to feel emotions.*

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Abstract: The aim of this essay is to examine how and to what extent the modality in the fictional android Data's language changed when he went from incapable to capable of experiencing human emotions. Focus is on subjective, objective and probability related modality in particular.

The conclusion reached from the results was that there seemed to be no evidence that either the frequency or the type of modality in Data's speech changed in any significant way from when he was unable to feel emotions to when he was not.

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1. Introduction

Shortly summarized, this essay will look at and analyze how emotions relate to the modality in an android's language. Will the type of modality change in any way if an emotionless android gains the ability to feel emotions, for example, will there be a more frequent usage of modal verbs in its speech when the android is affected by emotions? This essay will investigate if that is the case.

The specific topic for this essay was selected with a fictional android character from a television show in mind, which was the 1980's classic science-fiction show *Star Trek: The Next Generation*, the first in a series of spin-off shows of the original 1960's *Star Trek* show. It takes place aboard a star ship exploring the galaxy, and the audience gets to follow its crew's professional and private lives. This particular crew features an artificially created life-form among them, known by the name Data. He is a robot, but a more sophisticated type known as an android, which is essentially a robot made to closely resemble a human (Webster's online dictionary; 2012). What makes Data an ideal case for this study is how, during the entire seven season run of the show, Data was incapable of any sort of human emotions, but later, in the following movie adaptations of the show, he got an electronic emotion chip installed into his artificial brain, which allowed him to finally experience emotions, after being entirely void of them for seven years.

Dealing with such a hard to define semantic concept as modality, it would be beneficial to make an attempt to clarify the meaning of the term. As Klinge states, the concept of modality is a very loosely defined one, with no one indisputable definition (2005: 5). It is a complex semantic concept that has many different interpretations and models of approaching its analysis. Portner (2009: 1) defines modality as follows:

[...] modality is the linguistic phenomenon whereby grammar allows one to say things about, or on the basis of, situations which need not be real. Let's take an example: I say "You should see a doctor." I am saying something about situations in which you see a doctor; in particular, I am saying that some of them are better than comparable situations in which you don't see a doctor. Notice that what I say can be useful and true even though you do not see a doctor. Thus, what I say concerns situations which need not be real.

As mentioned earlier, this essay will have its focus on modal verbs. Modal verbs, such as *will* and *must*, are expressive of a speaker's attitude and opinions, which are largely based on the speaker's feelings towards what is being stated. With that said, the occurrence of modal words in the

speech of an artificially created life form such as an android, should logically alter if this robot has gained the ability to experience emotions. That is what this essay will investigate.

Since there is no one correct and indisputable definition of modality, therefore there also exists a variety of different models for analyzing it. For this essay, the Hallidian model to categorize the term modality will be used. This model identifies and recognizes four different sub-categories of modality, which are probability, usuality, willingness and obligation (Toolan 1998: 47).

The term probability means a modal word that indicates the chance of something happening or being true, like the word *might* in the sentence

(1) Smith **might** be in Montana.

Modal verbs that fall under the category of usuality are those that indicate how frequently something happens or is true, for example the word *usually* in

(2) Smith is **usually** in Montana.

Willingness is the category of modal verbs that deals with how ready someone is to do something, or under which conditions something is true, like the word *would* in

(3) Smith **would** be in Montana, if [...]

Lastly, words that express a need or a requirement for someone to do something, or for something to be true, fall under the category of obligation, like the word *should* in

(4) Smith **should** be in Montana.

Besides these aforementioned ways of categorizing modal verbs, this essay will also investigate the difference in occurrence between subjective and objective modality in Data's speech, with and without the influence of emotions. For this essay, the distinction between subjective and objective modality has been defined as whether the speaker is the subject of a modal verb in a sentence or not.

The sentence is subjective, for example in the sentence "I must go to bed now", whereas when something else, like an object, is the subject of the sentence, it has been classified as objective. An example of an objective sentence could be "My phone must be stolen" or "It must be raining."

Simply stated, a sentence with a 1st person has been classified as subjective, and a sentence with a

3rd person subjective has been classified as objective.

According to Portner (2009: 108), the difference between a subjective and an objective sentence is that objective statements are based on highly reliable evidence, while the evidence in a subjective one is less reliable. This could be tied in with the former definition as when the subject of a sentence is oneself, the evidence of it being true is less reliable than in an objective sentence, where the subject of the sentence is something other than the speaker.

1.1 Aim and hypothesis

The purpose of this research is to investigate whether or not there is a correlation between the modal verbs used in a fictional android's speech, and said android's ability to experience emotions.

Regarding the formulation of a hypothesis, one has to understand that the modality in Data's language should alter in some way from when he has and when he doesn't have emotions. This is because in the language of someone with feelings, the modality of one's speech is heavily influenced by one's attitude towards the subject of discussion, meaning how likely one thinks something is of happening, or how willing they are to doing something. Data however, when he was incapable of experiencing emotions, had no emotionally based preferences towards anything. Logically speaking, his speech should be void of emotional influence before he got his emotion chip installed. If the writers of *Star Trek: The Next Generation* had this in mind when writing Data's lines when he wasn't capable of feeling emotions, his language and the attitude based modality in his speech should be different compared to his speech later in the movies, where he has been outfitted with the emotion chip that allows him to experience emotions.

So, does the number of modal verbs uttered by Data differ greatly from when he does not have emotions to when he does? Likewise, is there a noticeable difference between his use of subjective and objective modal verbs? With these questions in mind, the following three hypotheses were formulated:

Hypothesis 1: The number of modal verbs in Data's speech will increase significantly when he

has gained the ability to feel emotions, since modality is largely based on attitudes and opinions.

Hypothesis 2: The types of modality, meaning probability, willingness, obligation and usuality, most used in Data's speech will change in some way when he has gained the ability to feel emotions.

Hypothesis 3: There must be a higher number of instances where Data uses subjective modality when he has gained the ability to feel emotions.

2. Material

The material for this investigation of modality was hand-picked based on several factors. Firstly, the episodes of *The Next Generation* to investigate Data's speech without emotions had to feature Data heavily, thus providing a maximum amount of material. Secondly, they also had to be evenly spread out during the course of the series, showing Data's language over a long period of time. Thirdly, they also had to be episodes where he did not have the ability to experience human emotions, since the episodes were supposed to provide the samples of Data's speech before getting that ability. Lastly, it had to be Data's own speech and not somebody else in his body. With these criteria in mind, the following four episodes were selected: *The Measure of a man* (season 2, episode 9), *Brothers* (season 4, episode 3), *Hero Worship* (season 5, episode 11) and *Inheritance* (season 7, episode 10).

In order to investigate whether or not the modality in Data's language had changed after getting emotions, the movie *Star Trek: First Contact* was selected, based on the same criteria as the above mentioned episodes. In this movie, he has gained the ability to feel emotions, thus it provided the material of investigation for his speech under the influence of human emotions.

3. Method.

After having selected four suitable episodes, transcripts of them were sought out on the website *Chakoteya* and examined. The relevant parts of the texts, namely Data's spoken lines with one or more modal verbs in them, were sorted out and categorized under accurate headings. These

headings described which type of modality the modal word had, and in the cases of the probability markers *might, may, can, could, will* and *must*, they were also rated on a scale from one to four, where one meant a high degree of probability and four meant a low degree. The following epistemic scale, found in *(De)Coding Modality* was used as a base for the one to four grading system implemented (Wärnsby 2006: 26).

Table 1: Degree of probability in modal verbs categorized as probability related

1	2	3	4
Confident inference	Reasonable inference	Tentative inference	Possible conclusion
<i>must</i>	<i>will</i>	<i>should</i>	<i>may, might, can, could</i>

This scale of probability degree lessens in intensity going from left to right. This means that *must*, numbered “1” and the farthest left modal verb in the table, is at the highest point of the probability scale. It is used regarding something happening of near-certainly. On the other hand, the right end of the table holds the weaker possibilities, like *may* and *might*, which are used to describe something that has a lower chance of happening or being true. In the middle of the table is *will* and *should*, meaning that these two are modal verbs of less certainty than *must*, but higher certainty than *may, might, can* and *could* (Toolan 1998: 49).

The reason why the different degrees of probability were examined was to provide more angles of studying the material at hand, especially in the case that the results where no noticeable differences in the frequency of modal verbs used between Data's language before and after he got the ability to feel emotions.

3. Results and discussion

3.1. Frequency of modality

A noteworthy thing to mention about the frequency of modality in Data's speech is how the number of sentences spoken by him with any modality in them varied greatly from episode to

episode, also from the episodes compared to the movie. In one of the episodes (episode 10, season 7 - *Inheritance*), Data had as many as 33 lines with one or more modal verbs in them, while he only had eight in another (episode 3, season 4 - *Brothers*). This greatly varying number of modal verbs was most likely influenced by the total number of lines spoken by the character in the studied episode. If Data spoke a lot of sentences in an episode, the amount of modal verbs in the script was noticeably higher. For example, Data had a total of 119 lines in the episode *Inheritance*, out of which 30 of these contained one or more modal verbs. In *Brothers* however, Data only had 61 lines in the entire episode, which resulted in a mere eight lines with modal verbs in them. The number of lines Data has is clearly relevant to the study, and should be taken into account when looking at the difference in number of modal verbs from episode to episode.

The hypothesis on the frequency of modality in Data's speech formulated earlier in this essay suggested that regardless of which different types of modality were found in the material, there would be a higher number of modal verbs in the analyzed material where Data has the ability to feel emotions, which was the movie. As seen in the table below, this was shown to be the case, even though the increase in modality was extremely small.

¹
Table 2: Percentage of total sentences spoken by Data which contained modal verbs

TV 1	TV 2	TV 3	TV 4	Movie
27 %	13 %	27 %	25 %	28 %

Calculated in percentage of modal verbs out of the total sentences spoken where Data is capable of feeling emotions, 28 % of the sentences he spoke had modal verbs in them. In the episodes, where Data could not feel emotions, the medium value calculated from the four different episodes

¹ . “TV 1” stands for the first of the studied television episodes (in chronological order), “TV 2” stands for the second, and so on, while “Movie” stands for *Star Trek: First Contact*.

was slightly lower, at 23 % sentences with modal verbs out of all Data's total ones in the script. However, it should be taken into account that this is a medium value calculated from four different episodes, and that the percentage for each individual episode varied both higher and lower than this medium value. In one of the four episodes, only 13 % of sentences had modal verbs, while one had a slightly higher percentage of 25 %, even though that is still noticeably lower than the 28 % of the sentences with modal verbs that Data spoke in the movie, where he is capable of feeling emotions. However, the two remaining episodes both had a total of 27 % sentences with modal verbs in them, which shows that the difference between when Data can feel emotions and when he cannot is only a mere percent if the episode with the highest percentage is compared to the movie, instead of the medium value of the four episodes.

3.2. Types of modality

The second hypothesis formulated dealt with the question whether the different types of modal verbs changed in any significant way when Data gained the ability to feel emotions. As seen in Table 3 below, the occurrence of the different types of modality varied too greatly and unpredictably for that hypothesis to be verified.

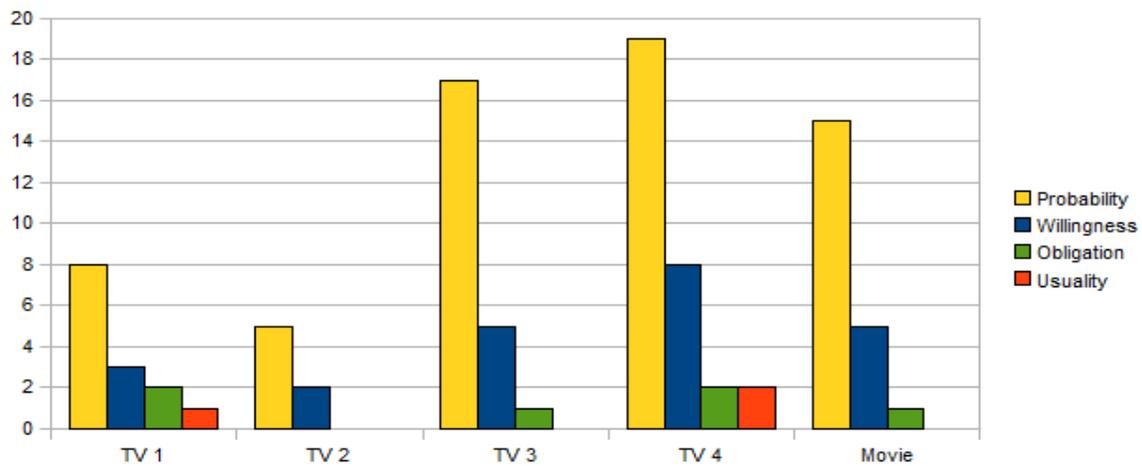


Figure 1: Number of modal verbs in the four categories of modality spoken by Data

Take Data's use of probability related modality as an example. He does utter more modal verbs

classified as probability in the movie than in the first and second episodes chosen from the TV series (TV 1 and 2) , which would suggest that his use of this type of modality does indeed change in a significant way when he is able to feel emotions. However, the fact that he utters more probability related modal verbs in the other two episodes of the TV series (TV 3 and 4) than in the movie, suggests that the hypothesis about Data uttering more modal verbs classified as probability after he has gained the ability to feel emotions than before in the material is false.

The same irregular pattern is visible throughout the table and all the different types of modality. Based on these results, no connection could be made between the use of a certain type of modality and Data's ability to feel emotions, based on the model of classifying modal verbs used in this essay.

3.2.1. Willingness, usuality and obligation

The occurrences of modality of the types of willingness, usuality and obligation in the analyzed material were very low in number, as seen in Figure 1 above, both before and after Data had gained the ability to feel emotions. To accurately analyze the changes in these three types of modality, from when Data can and cannot feel emotions, the amount of material to analyze would have had to be significantly higher, providing more results to validate or disprove the hypothesis.

However, there were sentences, as seen in Figure 1, containing these types of modal verbs both in Data's speech before and after he gets his emotion chip, which can be analyzed to illustrate their differences, even though they do not provide a sufficient amount of data to form a valid conclusion as to how the modality in Data's speech actually alters during the course of the series.

First, here follows some examples of obligation and usuality in Data's speech before he is capable of feeling emotions.

TEXT SAMPLE 1: OBLIGATION

[Data and Doctor Crusher are discussing whether or not they should tell someone how they have discovered that she is not human, but in fact an android]

Data: It seems that I **must** make a decision. Whether to tell Doctor Tainer that she is an android or to withhold that information from her. I do not know what to do.

Crusher: Why was Doctor Soong so adamant that she not be told?

Data: He seemed certain that if she knew, it would preclude the possibility of her being happy.

In this case, the word *must* in Data's first sentence indicates a requirement to do something, an obligation. Based on his current knowledge of the situation, he has deduced that he is obliged to make a decision of some kind, in this case the decision whether or not to tell Doctor Tainer what she really is. Based on this analysis, it would seem clear that this sentence could be classified as an obligation.

Another example of this kind, in this case of usuality, which was the least frequent type of modality as seen in Figure 1 (TV 1 and TV 4), can be found in the episode *The Measures of a Man*, where Data has a conversation with his friend and colleague Geordi La Forge about resigning from his job.

TEXT SAMPLE 2: USUALITY

Data: You do understand my reasons?

Geordi: Sure, I understand. I just don't like your being forced out. It's not fair.

Data: As Doctor Pulaski **would** at this juncture, no doubt, remind us, life is rarely fair.

It can be argued that the word *would* in Data's second sentence is a case of usuality related modality, since Data seems to be drawing the conclusion of what Doctor Pulaski would say to them if she was present, based on past experience. Doctor Pulaski giving out words of advice like this seems to be a frequent occurrence, something that usually happens. With that said, it has been

classified as usuality in this analysis.

Lastly, here follows an example of willingness in Data's speech before he has had his emotion chip installed, which can be found in the same episode as the example above.

TEXT SAMPLE 3: WILLINGNESS

[Data and Captain Picard are talking about how Data is being forced to undergo a procedure that would endanger his life]

Picard: [...] we have a problem.

Data: I find myself in complete agreement with that assessment of the situation, sir.

Picard: Your service to this ship has been exemplary. I don't want to lose you.

Data: I **will** not submit to the procedure, sir.

The willingness analyzed in this example is expressed by Data in the last sentence. "I will not submit to the procedure, sir." is Data making a prediction of a future event happening, namely him being forced to submit to a dangerous procedure. By saying "*I will not [...]*", he is expressing his willingness to make said future event happen, which in this case is lack of willingness. According to this analysis, this sentence has been classified as willingness.

Moving on to an example from when Data has the ability to feel emotions, the examples look very much the same. There is nothing in them that appears radically different from the sentences spoken by him when he was without emotions. Take for example, this excerpt with willingness in it, from the movie *Star Trek: First Contact*, where Data is now capable of experiencing emotions.

TEXT SAMPLE 4: WILLINGNESS

[The Borg Queen has captured Data and is trying to get him to co-operate]

The Borg Queen: [...] there's so much more for you to experience. I will guide you into a

world of sensation unlike anything you can imagine. All you have to do... is give us access to your neural net.

Data: No. I **will** not betray my friends.

In the last sentence spoken by Data is where the willingness is found, and it is near identical in every aspect to the willingness in text sample 3, before Data was able to feel emotions. The word *will* indicates willingness, or in this case his lack of willingness to betray his friends. It is willingness in the sense that it is something Data is not willing to do, and it is a prediction of a future event, Data betraying his friends, to which Data expresses his lack of willingness to make happen, exactly like text sample 3.

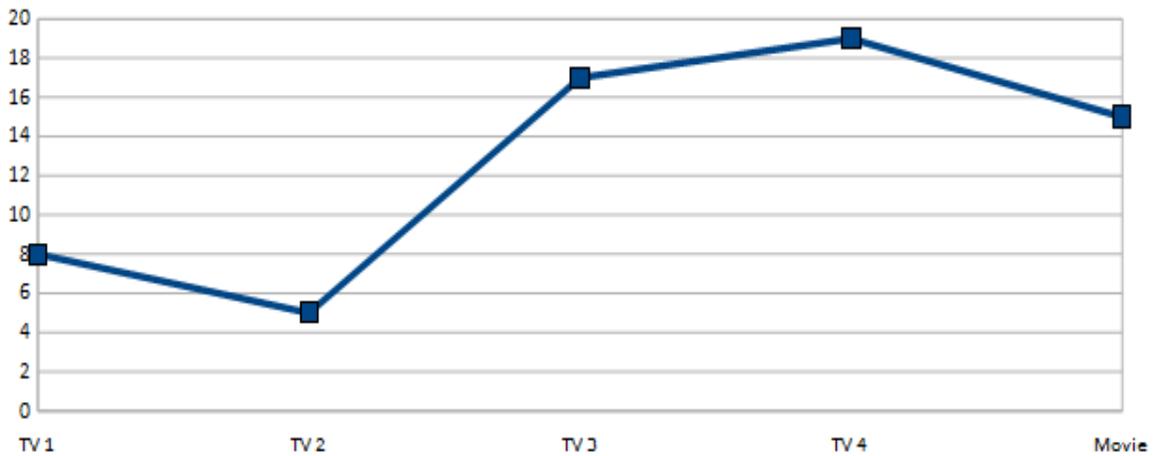
As seen in these examples, the occurrence of modality relating to usuality, obligation or willingness showed no obvious pattern relating to whether or not Data was capable of feeling emotions at the time. The difference in their occurrences before and after he gained the ability to feel emotions were so small that it provided no base for a conclusion to be drawn, nor did it seem directly related to whether or not Data could feel emotions or not at the time when the sentence was uttered.

3.2.2. Probability

The modal aspect of probability was the one that was most frequent in Data's speech, both before and after he gets his emotion chip installed. That made it the easiest to draw more accurate conclusions about the changes in Data's speech from.

Upon studying the material at hand, the difference in modality between when Data has and does not have emotions was without any clear patterns as well, which made validating the claim in the hypothesis that his use of probability related modality changes when he gains the ability to feel emotions impossible. Looking at the diagram below, one can clearly see that the frequency of probability related modal verbs did not change in a regular pattern from the television episodes,

where Data is without emotions, to in the movie, where he has emotions.



²
Figure 2: Modal verbs indicating probability spoken by Data in each episode/movie.

Figure 2 shows that the number of probability related modal verbs uttered by Data in the episodes (TV 1-4), where he is incapable of emotions, vary to a great extent. In the second analyzed episode, he only speaks five such modal verbs, while in the next, that figure is more than three times that amount. The frequency of probability related modal verbs simply differs to such a great amount from each episode that no claims can be made about the relationship between the modal verbs of the probability type and Data's inability to feel emotions in that examined material. Either this shows that there is no relation between the two, that the writers of *Star Trek: The Next Generation* simply did not pay any attention to this when they were writing Data's lines, or there is a relation between Data's ability to feel emotions and the amount of probability related modal verbs in his speech, only the analyzed material was too little to accurately show said difference, and that more episodes should have been studied. Either way, the hypothesis that formulated earlier that stated how the types of modality in Data's speech would change in a significant way related to his ability to feel

²
. TV 1” stands for the first of the studied television episodes (in chronological order), “TV 2” stands for the second, and so on, while “Movie” stands for *Star Trek: First Contact*.

emotions cannot be validated.

The modal verbs relating to probability were also classified on a scale from 1 to 4 according to how probable of happening or being true the modal word suggested that something was (see Table 1). As seen in Table 3 below, this method of analysis proved no help in finding a clear pattern of the changes in the modality in Data's speech either.

³
Table 3: Number of probability related modal verbs rated on a scale from 1 to 4 in intensity

	1	2	3	4
	Confident inference	Reasonable inference	Tentative inference	Possible conclusion
TV 1	4	0	4	0
TV 2	4	0	0	1
TV 3	11	0	5	1
TV 4	5	5	8	1
Movie	8	1	4	1

From Table 3, one can clearly read that Data favors modal verbs that convey a strong intensity of probability, confident and reasonable inferences, regardless of whether he is capable of feeling emotions or not. However, no clear connections can be made from the intensity of his probability to his ability to feel emotions. Neither his use of stronger nor weaker probability seemed to relate to his ability to feel emotions, as seen in the table above. It varied in such an unpredictable and unexplainable way that there was no valid and accurate conclusion about it to be made.

3.3. Subjective and objective modality

The third hypothesis formulated earlier stated that there would be a higher case of subjective

³ “TV 1” stands for the first of the studied television episodes (in chronological order), “TV 2” stands for the second, and so on, while “Movie” stands for *Star Trek: First Contact*. The scale of 1-4 in intensity goes from high to low.

first-person modality in Data's speech when it was being influenced by emotions, and a higher case of objective modality when it was not.

Studying the results from the material in the table below, one can clearly see that the hypothesis seems to be wrong, and that there seems to be no obvious correlation between Data having emotions and him using either subjective or objective modality.

⁴
Table 4: Percentage of different types of modality in Data's speech

	TV 1	TV 2	TV 3	TV 4	Movie
Subjective	44 %	25 %	60 %	33 %	32 %
Objective	56 %	75 %	40 %	67 %	68 %

Data's use of either subjective or objective modality seems to have no clear pattern throughout the chronological time line of the series, although in four out of five cases, Data favors the use of objective modality. For example, in *TV 3*, which stands for the season 5 episode *Hero Worship*, 60 percent of the total number of modal verbs uttered by Data in that particular episode are subjective in kind, such as “I will count to three” and “I must join Commander La Forge in Engineering” (Chakoteya; *Hero Worship*). It appears not to have any relationship to whether he is capable of feeling emotions or not. However, looking at the context of his sentences which contained modal verbs, there is a clear connection between that and Data's use of either subjective or objective modality. The more objective modality he uses in an episode or movie does not seem to have a clear connection with his ability to feel emotions. Instead, it seems to depend on what he is talking about, on what the over-all theme of the scene is. The episodes with more lines spoken in a professional working place setting have a higher amount of objective modality than episodes focused more on

⁴ . “TV 1” stands for the first of the studied television episodes (in chronological order), “TV 2” stands for the second, and so on, while “Movie” stands for *Star Trek: First Contact*. “Subjective” and “Objective” means percentage of modal verbs in the studied material, of either the subjective or objective kind.

Data's personal life. Take these two scenes from the same episode for example. The first scene is a short excerpt from a scene where Data is talking to a woman called Juliana, in a work environment.

TEXT SAMPLE 5: OBJECTIVE MODALITY

[Data and Juliana are working down at a planet when an earthquake strikes]

Data: There **will** be more seismic activity. We must hurry.

(They walk along a passage to where their working equipment is placed)

Data: The shaft has not been obstructed by the seismic activity. It **should** be possible to trigger the unit from orbit.

In this second scene, Data is still speaking to the same person, but this time in a private non-work related setting.

TEXT SAMPLE 6: SUBJECTIVE MODALITY

[Data and Juliana are in Data's quarters, talking about playing musical instruments together]

Juliana: Data, I'm very familiar with that Handel piece. How would you feel about my playing the viola part tomorrow?

Data: I **would** like that very much.

Juliana: I'll have to practice. You don't have a viola?

Data: I **could** replicate one for you. Computer, please replicate one viola.

Both of these excerpts contain two modal verbs each spoken by Data, but they are different depending on the setting, subjective in modality in one scene and objective in the other. In the scene where Data is at work, the two modal verbs *will* and *should* are both uttered in a sentence objectively, by stating “*There will be [...]*” and “*It should be [...]*” instead of a subjective

counterpart, which could have been something like “*I think there will be [...]*” instead. In the other scene, where Data is in his room in a private setting, he has switched to using subjective modality. In this setting, he is speaking from his own perspective and out of his own assessments, saying “*I would like that [...]*” and “*I could replicate one [...]*”. It would seem like the less formal the situation is, the more likely Data is of speaking from a first-person perspective, with subjective modality instead of the objective one that he is more inclined towards using in more formal work related settings.

What these examples, and the material in general, indicated was that Data's use of subjective versus objective modality did not seem to rely on whether or not he was capable of feeling emotions at the time, but much more on the situation he was currently in. The more formal situations, like work-related scenes, provided more objective modality, while the scenes with Data in a less formal situation showed a greater amount of subjective modality.

4. Conclusion

The analysis and discussion of the changes in the modality of Data's language, from when he is void of emotions to when he is capable of feeling them, showed that there were indeed some differences in the occurrence and types of modal words used by the android, but no significant ones. It seems like additional factors, such as to whom Data spoke to, had a greater influence on which type of modality was used than whether or not he was capable of feeling emotions at the time.

The first hypothesis stated that the number of modal verbs in Data's speech would increase significantly after he gained the ability to feel emotions. This assumption seemed to be false, according to the analysis. As seen in Figure 1, there was a slight increase in modality when Data had emotions, but it was very small. The hypothesis stated that the increase would be significant, which it was not in the selected episodes.

The second hypothesis formulated in the beginning of this essay suggested that the different types of modality in Data's speech would change in some way after he had gained the ability to feel

emotions. To some degree, this proved to be the case, but the change was too random to be able to analyze and draw a valid conclusion from. It did change, but the change had no distinct pattern, thus making a further analysis of the change difficult. The random changes in occurrences of these different types of modality would suggest that the changes did not have much or anything to do with Data's ability to feel emotions.

The third and last hypothesis claimed that there would be a higher amount of instances where Data uses subjective modality when he has gained the ability to feel emotions, which means higher than the amount of subjective modal sentences before he was able to feel emotions, and not higher than the amount of objective sentences. This was disproved by Table 4, which clearly shows that Data's use of subjective modality was higher in percentage in three out of the four episodes, where he has no emotions, than in the movie, where he has emotions. As with the two previous hypotheses, the pattern of the change in modality from the episodes to the movie gave no indication that Data's use of a certain type of modality had anything to do with his capability of feeling emotions.

Summarizing this conclusion, the influence of emotions seemed to have little to no effect on the use of modal verbs in Data's speech in the material investigated. However, there may still be some truth to the hypothesis that Data's language does in fact change in its modality when he is influenced by emotions. There may have been a more clear difference between his speech before and after his emotion chip was installed if more material was chosen to investigate. Another possibility is that the modality in Data's speech changed in some other way than specifically his use of modal verbs. These questions could serve as a starting point for further research into the topic in the future.

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