

**“Interpretative Repertoires” as Predicators for Social
Action: A Discursive Analysis of Uncertainty in Covid-19
Medical Research**

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Abstract

The current research seeks to examine the possibility of using "interpretative repertoires" to predict the social actions taken by the decision makers and the public. To achieve this purpose, a discursive discourse analysis is used to identify the uncertainty in the discourse of the scientific research that investigates the use of chloroquine and hydroxy-chloroquine in the treatment of Covid-19. Then, the effects of the uncertainty employed in the chloroquine research on the decision makers are investigated. Similarly, the influence of the declarations of the decision makers on the public is explored. The results reveal that uncertainty markers are identified in the discourse of chloroquine research with a relatively high percentage. Also, the different types of uncertainty are signaled in the discourse. Moreover, the results reveal that the decision makers adopt an ignoring strategy when dealing with uncertainty in the chloroquine research. The declarations of the decision makers are not based on the "interpretative repertoire" elicited from the chloroquine research. On the other hand, the public's social actions are initiated by the interpretative repertoire identified in the declarations of the decision makers. However, the public adopt an overreaction behavior which leads to problems in the Egyptian drugs market.

Key Words: *uncertainty, discursive discourse analysis, interpretative repertoire, Covid-19 treatment*

"الأطر التأويلية" كمؤشر للسلوك الاجتماعي: تحليل استطرادي لعدم اليقين في الأبحاث الطبية
المتعلقة بكوفيد-19

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المستخلص

يسعى البحث الحالي لدراسة إمكانية اعتبار الأطر التأويلية مؤشراً للإجراءات الاجتماعية التي يتخذها صانعي القرار وللسلوك الاجتماعي الذي يتصرف به العامة. ولتحقيق هذا الهدف فقد اعتمد البحث الحالي علي إجراء تحليل استطرادي لتحديد الأنماط المختلفة لعدم اليقين التي يمكن رصدها في التقارير البحثية لعينة من عدد (20) بحث طبي تم نشرها في الفترة من 1-2019-12 حتى 15-4-2020 واهتم كل منها بدراسة فاعلية استخدام الكلوروكين والهيدروكسي كلوروكين في علاج كوفيد 19، كما تم دراسة تأثير أنماط عدم اليقين التي تم رصدها علي صانعي القرار من خلال تحليل خطاباتهم السياسية أو قراراتهم المعلنة في وسائل الاعلام المختلفة، وكذلك دراسة تأثير هذه القرارات المعلنة من صانعي القرار علي العامة. وقد خلصت نتائج البحث إلي أن عينة البحوث التي تم تحليلها استخدمت أنواع عدم اليقين بنسبة كبيرة، و أن صانعي القرار تبنوا استراتيجية التجاهل عند تعاملهم مع مؤشرات عدم اليقين، ولم يعتمد صانعي القرار علي الأطر التأويلية التي يمكن استنباطها من عينة البحوث الطبية التي تم تحليلها. بينما أشارت النتائج أن سلوك العامة بدا متأثراً بالأطر التأويلية التي تم استنباطها من تصريحات صانعي القرار، ولكن بعد ذلك تبني العامة سلوكاً مبالغاً فيه كرد فعل لإجراءات صانعي القرار مما أدى الي انتشار ظاهرة الاحتكار والسوق السوداء لأدوية الكلوروكين والهيدروكسي كلوروكين في سوق الأدوية المصري.

الكلمات المفتاحية: عدم اليقين، تحليل استطرادي، أطر تأويلية، علاج كوفيد 19

Introduction

Interpretative repertoires are considered the building blocks which comprise a range of terms a speaker uses to construct a social action (Toth, 2014). An interpretative repertoire is an evaluative description derived from the discourse of people's argument and talk. It is a culturally familiar argument in which people use common places and tropes, familiar clichés and recognizable themes in order to be persuasive (Goodman, 2017). Therefore, interpretative repertoires could be identified as directors of social actions, as they embrace methods that help analysts make sense of a context by analyzing the language used in this context.

Covid-19 pandemic is an outstanding phenomenon that challenges the whole world, due to its high infectivity and mortality rate. The will to find a treatment to this fatal virus obsesses the minds of scientists, decision makers and public (Rebeaud & Zores, 2020). So, studies that manipulate possible treatments for the virus are grabbed by everyone. The possibility of treating covid-19 by the use of chloroquine and hydroxy-chloroquine is manipulated in different studies.

Although there is an urgent need to find a treatment to Covid-19, the results of the scientific research should be analyzed carefully to form an authenticated interpretative repertoire that guides the decision makers. It is fundamental to discriminate certain and uncertain information in these studies, due to the dangerous outcomes that are based on the results of these studies (Bongelli, Riccioni, Burro & Zuczkowski, 2019). The current research seeks to investigate the influence of uncertainty in the interpretative repertoire elicited from the results of the chloroquine research on the social actions of the decision makers and the public.

Objectives of the research

This research seeks to investigate the possibility of using the "interpretative repertoire" elicited from scientific research as a predictor for the actions taken by decision makers. Also, it seeks to explore the potentiality of using the "interpretative repertoire" derived from the declarations of the decision makers as a predictor of the public's social actions.

Theoretical background

Uncertainty is one of the features that should be inspected in scientific research, as it affects the credibility of the results. Uncertainty is defined as a situation where inadequate, inexact or unreliable information is available (Walker et al., 2003). Also, uncertainty is defined as a sense of doubt that impedes a decision-maker from taking an action (Haase, 2018). Types of uncertainty, linguistic markers of uncertainty and the

different strategies that could be followed by decision makers when dealing with uncertainty are discussed in the following section.

Types of uncertainty

Semantic uncertainty

Semantic uncertainty occurs when there is no agreement on the meanings of the same phrases or concepts within the same interaction. (Fox 2008, pp. 93-94). Semantic uncertainty embodies ontological uncertainty which is related to people's realization of the entities that exist in the world and the relationships between these entities. Ontological uncertainty occurs when there is no consensus among different participants in the same interaction about the similarities and differences between the same ontologies. (Fox, 2008, pp. 89-99)

Epistemic uncertainty

Epistemic uncertainty is related to knowledge. It occurs when inaccurate or insufficient knowledge, erratic measurements and/or subjectivity exist (Walker et al., 2003). So, epistemic uncertainty is concerned with the availability and adequacy of information or expertise. (Fox & Ülkümen, 2011). It has three gradations: agreed by all, known but not agreed, and known by no one. (Fox 2008: 94).

Aleatory

Aleatory uncertainty is related to the inherent variation and the deductibility of a term or a concept (Ülkümen, Fox & Malle, 2016). It is concerned with future events and focuses on the possible outcomes in repeated experiments (Van der Bles et al., 2019). It has three gradations which are: predictable, predictable in the same circumstances and never predictable (Fox, 2008, p. 94).

Linguistic Markers of uncertainty

There are different linguistic items that accompany the use of uncertainty. They are considered indicators or markers of the existence of uncertainty. These markers include lexical markers, syntactic markers and semantic markers.

1. Lexical markers

Hedges are the most obvious lexical items in different text genres. A hedge is a word whose job is to make the exact meaning of some quantities or qualities less or more blurred. Hedges include intensifiers, deintensifiers and approximators (Vincze, 2013). Intensifiers or amplifiers are adverbs or adverb phrases that intensify the meaning of a quantity or a quality upwardly. Intensifiers include words like much, too and very (Nelson, 2001, p.55). Deintensifiers are adverbs or adverb phrases that downwardly intensify the meaning of an adjective or another

adverb. Deintensifiers include words like less, slightly and a bit (Vincze, 2013). Approximators are words which circumscribe the precise quantity or quality of an event or entity. Approximators include words like almost, above, about, nearly, approximately, as high as and no larger than (Ferson et al., 2015).

Chen, Song and Heo (2018), through a computational analysis of uncertainty markers, suggest a number of markers that should be added to the linguistic markers list of uncertainty like inconsistently, unpredictably, unexpectedly, and controversially. Additionally, Poggi, D'Errico and Vincze (2019) add words of contradiction like even, though, but, though, although, and yet to the uncertainty markers list, as a result of their cognitive analysis to participants' perception of text uncertainty markers.

2. Syntactic Markers

There are different forms of syntactic markers of uncertainty. These markers include epistemic verbs, epistemic non-verbs, modals, if-category, comparatives and the use of the passive voice. These markers are illustrated in the following.

Epistemic verbs express the perspective of the speaker on the argument which is being talked about. Examples of epistemic verbs are "believe", "think", "suppose" and "seem" (Precht, 2003, pp.133-134).

Epistemic non-verbs refer to adjectives, adverbs, nouns and personal attributes that indicate the speaker's reflection on the argument. Epistemic adjectives include hedges like possible, likely, and unlikely, while epistemic adverbs include adverbs like perhaps, potentially and probably. Epistemic nouns include words like doubt and impression. Personal attributes refer to phrases like "in my opinion" and "according to my own point of view" (Bongelli, Riccioni, Burro & Zuczkowski, 2019)

Modals are verb units that are used to determine the (un)certainly of the actions (Kakzhanova, 2013). "Modals" include modal verbs in the present like: "may", "can", "will", and "must", and in the conditional mood like "might", "should", "could", and "would". (Bongelli, Riccioni, Burro & Zuczkowski, 2019).

"If-category" is one of the markers of uncertainty. "If-category" includes the explicit use of "if" as a connective in the conditional sentence (Omero et al., 2020), the implicit use of conditional clauses introduced by unless, whether, if-less, provided that, in case, supposing, assuming that and any other temporal connective like "when", and "in case of". (Krzyżanowska, 2015, pp.11-12).

Comparatives are found to be one of the uncertainty markers. Goncharov and Irimia (2020) indicate that comparatives could lead to

uncertain inferences. Finally, passive voice is used in scientific writing in order to indicate the uncertainty of the writer (Rein, 2015).

Strategies to deal with uncertainty

There are different strategies that could be followed by decision makers to deal with uncertainty. The first strategy is ignoring or denial of uncertainty. In this strategy, the decision makers take the gamble of making a decision and deny the existence of uncertainty (Pasquini, Steynor and Waagsaether, 2019, pp. 31-33).

The second strategy is trying to reduce the uncertainty by asking for more information. Decision makers try to support their decision by gathering more information to lessen the uncertainty (Gurkov 2010).

In the third strategy, decision makers are completely aware of the risks of the uncertainty. They try to take a decision that take these risks into consideration (Pasquini, Steynor & Waagsaether, 2019, pp. 31-33).

In the fourth strategy, the decision makers involve the stakeholders of the decision in the process of decision making. Decision makers inform the stakeholders of the uncertainty that decision makers face, asking for support (Bodde et al., 2018).

Research Questions

To achieve the purpose of the current research, the following questions are sought to be answered:

1. How often are uncertainty markers employed in the corpus of the chloroquine research?
2. What are the different uncertainty markers used in the chloroquine research?
3. What are the different types of uncertainty that are used in the chloroquine research?
4. What are the strategies that are employed by decision makers as a response to the uncertainty in the results of the chloroquine research?
5. How do the public perceive the declarations about the use of chloroquine in the treatment of Covid-19?
6. What is the possibility of using an "interpretative repertoire" as a predictor of the social actions of the decision makers and the public?

Methods

To answer the previous questions, a discursive discourse analysis approach is adopted. An interpretative repertoire that could be elicited from the medical research related to the use of chloroquine and hydroxy-chloroquine as a treatment for Covid-19 is created. Then, the impact of

this interpretative repertoire on the decision makers is investigated. Thereafter, an interpretative repertoire that is derived from the declarations of the decision makers regarding the use of chloroquine and hydroxy-chloroquine is composed. Consequently, the influence of these declarations on the public is surveyed.

Discursive discourse analysts see discourse as a mixture between texts and social elements. So, social world is textually construed. However, the construction of social actions depends on a variety of contextual factors such as the nature of the social reality that exists, and the constructor of this reality (Fairclough, 2003, p. 9). Discursive discourse analysis focuses on putting descriptions together in a way that manage taking actions in social communications. Discursive analysts treat texts as social actions that are drawn on from specific resources (Potter, 1996, pp. 104-110). Discourse, whether written or spoken, is regarded as a representation of the world directed toward social actions and language is considered the dynamic tool that shapes the social world such as social relations and identities. Resources that help construct social actions in social interactions are called "interpretative repertoires" (Jørgensen & Phillips, 2002, pp. 96-97). Potter (2012, pp. 122-123) elucidates that an interpretative repertoire covers a range of resources including words, grammatical structures, conversational practices and rhetorical commonplaces which help construct a discourse. While discourse is constructed by the use of these resources, it could be constructive. Discourse could be used to build broader structures such as social organizations and psychological worlds.

Adopting the discursive discourse analysis, the discourse employed in the current research is divided into three sections. In the first section, a discourse of 20 research papers related to the use of chloroquine and hydroxy-chloroquine, as a treatment for Covid-19 are analyzed to explore the forms of uncertainty used within these studies and to shape out a possible interpretative repertoire on which decision makers should adopt to form their actions. Then, a sample of the speeches of decision makers, as declared in public speeches and in newspapers, is analyzed to find out the responsible people's resolutions regarding the use of this drug. Finally, the impact of the interpretative repertoire derived from the declarations of the decision makers on the public is investigated by using two ways. The first is analyzing newspaper articles that reflect people's reaction. The second is interviewing a random sample of the public to explore their reaction towards the declarations of the responsible people.

Analysis

Analysis 1

After the outbreak of the pandemic of Covid-19 in November 2019, a great number of researchers tried to find a treatment for this fatal virus. Some research papers manipulated the use of chloroquine and hydroxy-chloroquine as a treatment for Covid-19. During the period of 01-12-2019 to 15-04-2020, about 2000 research papers focused on the use of chloroquine and hydroxyl-chloroquine. 20 free-published studies of these papers are randomly chosen to build the 50000-word corpus of the current research. These 20 studies are combined together in one document after deleting the references and authors' identification notes. The corpus of these studies is divided into sentences. The corpus comprises 1660 sentences. The AntConc Software is used to analyze the corpus and identify the uncertainty markers. The corpus is reviewed to make sure that the identified uncertainty markers are valid. To investigate the validity of these markers, three specialists in linguistics are asked to examine uncertainty markers in the chloroquine corpus. Kendall's correlation coefficient between the three specialists and the author is calculated by the use of SPSS. For the sake of quantitative analysis, the means of the uncertainty markers identified by the author and the three specialists are calculated (Table 1).

Table 1.

**Means of uncertainty markers in the corpus of chloroquine
medical studies**

	Uncertainty Markers	Frequency of use
Lexical Markers	Hedges	60.75
	Words of contradiction	157
	Lexical expressions	3.75
Syntactic Markers	Epistemic verbs	11.25
	If-category	140
	Comparatives	168.75
	Passive	733.5
	Modals	392
	Epistemic non-verbs	171.25
Sum		1838.25

***Kendall's coefficient = 0.9**

The rate of using uncertainty markers in the corpus is calculated by dividing the total sum of the means of using the uncertainty markers by the total number of the sentences of this corpus. It is found that the uncertainty markers employed in the corpus are by a rate of 1.1

uncertainty markers/sentence. It means that each sentence has at least one uncertainty marker, either lexical or syntactic.

The qualitative analysis of the corpus indicates that the different types of uncertainty are identified in the medical studies corpus. Semantic uncertainty is detected in 17 studies out of 20 (85% of the studies). There is no consensus on the effects of using the chloroquine as a treatment. Some studies see that the use of the chloroquine leads to the death of the host cells, while others indicate that chloroquine effects are directed towards Covid-19 virus. As for the aleatory uncertainty, the results of 15 studies, out of 20 (75% of the studies), refer to the inconsistencies of the results where Covid-19 symptoms are relieved in some cases, intensified in others, and have no effect on a third sample. So, the future effects of using chloroquine to improve the symptoms of covid-19 are difficult to be predicted. The rest of the studies (5 studies) could not reach a finding, as the patients of the tested sample suffer from Covid-19 in combination with other diseases that may hinder the effects of chloroquine, such as renal troubles or high blood pressure. Concerning the third type of uncertainty, which is epistemic uncertainty, 100% of the studies indicate that the effects of using chloroquine in treating viruses are known. However, 7 studies (35% of the studies) agree on the possible potentialities of using chloroquine to treat covid-19, while the rest of the studies (65% of the studies) do not agree on its potentialities. So, the effects of using chloroquine on treating covid-19 are known, but not agreed on by all.

The interpretative repertoire that could be derived from this analysis is that chloroquine and hydroxy-chloroquine are helpful in treating viral infections like Malaria. However, the effects of this drug on the treatment of Covid-19 are uncertain. The side effects of using this drug by people who suffer from other diseases are uncertain. So, the potentiality of using chloroquine in the treatment of Covid-19 needs more investigation.

Analysis 2

Analysis 2 explores the influence of the interpretative repertoire derived from chloroquine studies on the decision makers. This is done by analyzing the discourses that reflect the responses of decision makers towards the use of chloroquine as a treatment to Covid-19. It is found that decision makers all over the world adopt the use of chloroquine and hydroxy-chloroquine in the treatment of Covid-19. Examples of the resolutions of decision makers are illustrated in the following section.

Donald Trump, the 45th President of the USA, in his speech on the 19th of March 2020, adopted chloroquine as a wonderful treatment for the novel Covid-19. He announced that it would be available soon. He proved

his decision by adopting a statement in the chloroquine research that indicated the successful use of chloroquine in the treatment of Malaria and arthritis a long time ago. Trump deduced that this medicine would not kill anybody. He ignored all the uncertainties identified in the chloroquine research that recommends more investigation.

Similarly, on the 13th of March 2020 the World Health Organization (WHO) agreed to the inclusion of this drug as a clinical treatment, after surveying the available research related to the use of chloroquine and hydroxy-chloroquine in the treatment of Covid-19. So, the WHO officials ignored the uncertainties that existed in chloroquine research and supported its use in the treatment of Covid-19, although they referred to the need for more profound investigation. On the 20th and 27th of May 2020, WHO declared that the use of the chloroquine in the treatment of Covid-19 could have negative side effects on the patients, especially those who suffer from other diseases.

Likewise, Ministry of Health in Egypt, as indicated in "Alyoum Alsaaba" Newspaper on the 19th of March 2020, referred to the production of two drugs based on chloroquine in Egypt. On the 28th of March, as stated in the online newspaper "Egypt Today", the Minister of Health declared the use of chloroquine in the protocol of Covid-19 treatment in Egypt.

The interpretative repertoire that could be derived from the responsible people's declarations is based on the possibility of treating Covid-19 by the use of chloroquine and hydroxy-chloroquine. Further, decision makers declared the availability of this medicine in the drugs market as it is an effective treatment for Covid-19.

Analysis 3

The discourse of newspaper articles that trace the public's reaction to the declarations of using chloroquine as a treatment to Covid-19 is scrutinized in analysis 3. Seven of the most read online Egyptian newspapers, which are followed by a great number of people on Facebook and Twitter*, are explored in the period of 28/2/2020 to 15/4/2020 to elicit the public's response in Egypt. It is indicated that Egyptian public consider chloroquine a drug that not only cures Covid-19 but also helps not to be infected, as well. On the 26th of March, "Noon Post" journal referred to the lack of chloroquine in the Egyptian drugs market due to the repeated requests by the masses for the chloroquine drugs. Similarly, "Masrawy" news site referred to the great potential of

* The number of followers of these online newspapers on Facebook and Twitter is illustrated in Appendix (C)

people to be infected by Covid-19 due to the crowds that request chloroquine drugs. The journal of "Sada Albalad" referred to the disappearance of chloroquine drugs from Egyptian pharmacies because Egyptians tend to store it with great amounts. "Masr Alarabia" journal added that the price of chloroquine drugs raised from 90 pounds to more than 800 Egyptian pounds as a result of its repeated requests. The journal of "Alaraby Post" indicated that Egyptians need mediators to get chloroquine drugs which is found only in dark markets as a result of its excessive requests. Also, the journal of "Elwatan", "Aldostor", "Alahali" and "Smart News" referred to Egyptians' excessive request of chloroquine drugs as preventive drugs and as a treatment of Covid-19.

To elicit the influence of the declarations of the responsible people on the public experimentally, a 12-item survey is built (Appendix C). The items of the survey are based on yes/no questions to ease the registration of the responses of the public. The survey is applied to 200 Egyptians. 80% of the respondents (160 persons) have heard about the declarations of the Egyptian Ministry of Health as to the possibility of using chloroquine to treat Covid-19. 70% of the respondents think that chloroquine could be effective in treating Covid-19. 50% of the respondents know at least one of the trade names of the chloroquine drugs, while only 3% knows about the other diseases that could be treated by the chloroquine. 18% of the respondents use chloroquine to treat other diseases like rheumatoid. 53% of the respondents keep chloroquine drugs at home to be used when infected by Covid-19. 40% of the respondents believe that chloroquine would prevent them from Covid-19 infection. 45% of the respondents find it difficult to get chloroquine drugs from pharmacies.

So, the public depend on the interpretative repertoire derived from the declarations of the decision makers who announce the availability of a treatment for Covid-19 in the drugs market, which is Chloroquine.

Results and Discussion

The result of analysis 1 indicates that linguistic markers of uncertainty are employed with a rate of 1.1 uncertainty marker/sentence. Similarly, the qualitative analysis of the corpus of the chloroquine studies indicates that all types of uncertainty are detected. Ontological, aleotory and epistemic uncertainties are identified in most of the results used in the chloroquine corpus. Fox (2008, p. 96) elucidates that ontological uncertainty could lead to the failure of a decision making, as it refers to the inconsistencies of the relationships between entities in the world. Although the epistemic uncertainty limits the ability to make inferences (Beven, 2015), it requires more research to be reduced (Bodde et al.,

2018). On the other hand, aleatory uncertainty cannot be diminished (Fox & Ülkümen, 2011). So, it could be concluded that chloroquine use in the treatment of Covid-19 is not reliable and it requires further investigation.

However, as indicated in analysis 2, most of the responsible people adopt the strategy of ignoring the uncertainty included in the corpus of chloroquine studies. Although ignoring uncertainty could have terrific effects on the public health, the decision makers resort to adopting it as a treatment. The decision makers' disregard of the uncertainty could be attributed to their social and psychological need to make decisions that calm the public, due to the high mortality and infectivity of Covid-19. For example, as stated in the reports of Garcia-Roberts and Braga (2020) in "USA Today" on the 12th of April 2020, Edwards (2020) in the "Time" on the 19th of March 2020 and in the comment of Coll (2020) in "New Yorker" on the 6th of April 2020, Trump was criticized by his Democratic rivals as he did not provide suitable atmosphere for solving the crisis of Covid-19. So, Trump needed to be successful in handling this crisis by finding a quick treatment for the fatal virus, but he ignores the uncertainty in the chloroquine studies. Similarly, the Egyptian Ministry of Health ignored the uncertainty and referred to the availability of the treatment of Covid-19 in the Egyptian drugs-market. This could be a quick response to the calls raised by parliament members, public and health organizations all over the world to face the increasing numbers of Covid-19 patients in Egypt and the increase in the mortality rate in a short period of time (Abou-Ghazala, 2020; Bogoch, 2020). The Egyptian Ministry of Health tried to be quickly responsive to the crisis regardless of the uncertainty that existed in the chloroquine research, as the public were calling for any procedure to be saved from this fatal virus. On the other hand, the WHO, responded quickly to the chloroquine studies and adopts the ignorance strategy on the 13th of March 2020. However, later on, WHO advisors adopted the involvement strategy when they declared the possible negative effects of using Chloroquine, on the 20th and 27th of May 2020, leaving the public the choice of an option. The results of Ghadim, Pannell and Burton (2004) ensure that involving the stakeholders in the decision making and providing them with the available information, the existing uncertainty is necessary in the time of crisis.

Analysis 2 indicates that although uncertainty is an apparent feature in the interpretative repertoire elicited from the chloroquine research, decision makers ignored this uncertainty and adopted chloroquine as an effective treatment to Covid-19. However, decision makers should have sought to reduce the uncertainty to be able to make a suitable decision, as

indicated in the study of Haase (2018). So, depending on the results of the scientific research does not help anticipate the social actions of the decision makers.

The results of the current study are concurrent with the results of Lu (2013, pp. 17-19) who indicates that managers tend to adopt an ignoring strategy in the time of crises. Lu refers to the ignoring strategy adopted by the Chinese minister of health in 2002 when he declared that SARS was under control. The Chinese minister of health ignored the panic effects of SARS and possibilities of being a pandemic that threatens the whole world if it is not controlled.

As for the public's response to the declarations of the decision makers, the public are not responsible for analyzing the results of the scientific research. Accordingly, the public take the declarations of the decision makers for granted as indicated in the survey and in the journalistic reports. The public are psychologically excused because of the fear that has dominated the community since the outbreak of Covid-19. The public seeks for any possible hope for the fatal virus. Therefore, the public follow the leaders and decision makers who ignore the uncertainty and declare the successful use of chloroquine as a treatment to Covid-19. This result agrees with Maccoby's (2004) results which conclude that the public follows the leaders whether consciously or unconsciously as the public are afraid to be lost without following the leaders especially in the time of psychological pressure. So, the public are eager to get this drug and take it in advance to feel safe.

The interpretative repertoire derived from the declarations of the decision makers directs and initiates the social behaviour of the public. However, the public adopt overreacted social behaviours in an unexpected way. Consequently, the interpretative repertoire derived from the declarations of the decision makers could not be used as a predictor of the social behaviours of the public.

Conclusion

The current research seeks to answer six questions by adopting a discursive discourse analysis approach. The first one is "How often are uncertainty markers employed in the corpus of chloroquine research?" The quantitative analysis of the corpus of chloroquine research reveals that uncertainty markers are employed with a rate of 1.1. uncertainty marker/sentence.

The second question is "What are the different uncertainty markers that are found in the chloroquine research?" Analysis 1 indicates that different linguistic markers of uncertainty are employed in the corpus of the chloroquine research. Lexical markers are detected through the use of

hedges and words of contradiction, while syntactic markers are represented in the use of epistemic and non-epistemic verbs, if-category, comparatives, passive forms and modals.

The third question, which is "What are the different types of uncertainty that are used in the chloroquine research?", is answered through the qualitative analysis of the corpus of the chloroquine research. It is found out that the three types of uncertainty are employed in the corpus. Semantic uncertainty represents 85% of the corpus studies, whereas aleatory uncertainty constitutes 75% of the corpus studies. As for the epistemic uncertainty, it is found that the effects of using chloroquine to viruses like Malaria are known by all, but its potentialities in treating Covid-19 are not agreed by all.

The fourth question, which is "What are the strategies that are employed by decision makers as a response to the uncertainty in the results of the chloroquine research?", is answered by pursuing the decisions declared by a sample of decision makers like Donald Trump, Ministry of Health in Egypt and WHO. It is found that Donald Trump and the Ministry of Health in Egypt adopt an ignoring strategy when dealing with the results of the chloroquine research. Similarly, the ignoring strategy is adopted by the WHO in the beginning, then involving strategy is applied later on by informing the people of the possible dangerous side effects of the use of chloroquine in treating Covid-19, leaving the public the opportunity to take the risk.

The fifth question, which is "How do the public perceive declarations about the use of chloroquine in the treatment of Covid-19?", is answered by tracking the impacts of the responsible people's declarations about the successful use of chloroquine in treating Covid-19. Also. A survey is conducted to elicit experimentally the public's response towards the declarations of the responsible people. It is found that the Egyptian public tend to get a great amount of the chloroquine drugs in a way that caused a trouble in the Egyptian drugs market. Egyptians tend to use the drug not only as a treatment for Covid-19, but also as a protection from the infection which no result referred to such a use.

The sixth question, which is "What is the possibility of using an "interpretative repertoire" as a predictor of the social actions of the decision makers and the public?", is answered through the discursive analysis approach adopted in the current research. It is indicated that the interpretative repertoire that is elicited from the chloroquine research could not be used as a predictor of the actions of the decision makers. Decision makers have not depended on the interpretative repertoire

presented in the chloroquine research which has employed different types of uncertainty to indicate that the efficiency of using chloroquine in treating Covid-19 is not certain. The decision makers have ignored the uncertainty that existed in the chloroquine research. This could be attributed to the scary effects and high infectivity and mortality of Covid-19. Therefore, the decision makers declare the discovery of a treatment for Covid-19. As for the public, discursive discourse analysis reveals that the public's overreaction is initiated by the interpretative repertoire derived from the declarations of the decision makers. However, the public react unexpectedly to the declarations of the decision makers. So, the interpretative repertoire derived from the declarations of the decision makers is difficult to be used as a predictor of the social behavior of the public. It could be concluded that "interpretative repertoire" could not be used as a predictor of social actions of the decision makers. Although the interpretative repertoire initiates the social behaviour of the public, it could not be used to expect the social behaviours of the public.

Limitations

The inability to depend on the interpretative repertoires derived from the scientific research as a predictor of the social actions of the decision makers could be limited to the time of crises. So, more research is required to be able to generalize this result or limit it to critical hard times. Also, the results of the current study may be applicable only to the Egyptian public. So, generalizing the results to the public all over the world needs more investigation.

Recommendations

The current research recommends that uncertainty in scientific research should be signaled and taken into consideration by decision makers. Decision makers' declarations should be based on a deep analysis of the scientific research, as these declarations affect broadly the behaviour of the public.

Further research

The use of interpretative repertoires as predictors requires more investigation in different social circumstances. Also, the relationship between interpretative repertoires and the cultural background of the public could be further explored.

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Appendix A

List of Studies used in the Chloroquine corpus

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Appendix B

List of the Newspaper Articles used in Analysis 2 and 3

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Appendix C
Number of the followers of the online newspapers on Facebook and Twitter

The Online Newspaper	Number of Followers of Facebook	Number of Followers on Twitter
Al-Ahali	188,136	520
Alaraby Post	6,673,054	410 K
Aldostor	4,578,135	294.8 K
Alwatan	15,324,965	251.8 K
Alyoum Alsabaa	22,621,981	10,9 M
Egypt Today	91,850	34.7 K
Masrawy	8,462,075	2,5 M
Masr Alarabia	1,484,133	142,9 K
Noon Post	1,570,207	77 K
Sada Albalad	7,261,275	962 K

Appendix D Chloroquine Survey

Name (optional):

Occupation (optional):

N.	Item	Response	
		yes	No
1	Have you heard about the declarations of The Egyptian Ministry of Health about the possibility of using Chloroquine in treating Covid-19?		
2	According to these declarations, do you think Chloroquine could treat Covid-19?		
3	Do you think chloroquine could protect you from covid-19 infection?		
4	Do you know any of the trade names of the drugs that include chloroquine?		
5	Do you know the diseases that the chloroquine may treat?		
6	Have you bought any of the chloroquine pharmaceutical drugs?		
7	Have you consulted a doctor before buying chloroquine drugs?		
8	Do you take any of the chloroquine drugs to protect you from covid-19 infection?		
9	Do you take any of the chloroquine drugs for the treatment for covid-19?		
10	Do you take any of the chloroquine drugs to treat any other disease rather than Covid-19?		
11	Do you find it difficult to get any of the chloroquine drugs as it may not be available in the pharmacies?		
12	Do you keep any of the chloroquine drugs to be used if you are infected with covid-19?		

General comments

