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COVID-19: EXPLORING LINGUISTIC INDICATORS OF CONSPIRATORIAL THINKING IN THE MEDIA[1]
A case study of *Coronacast*

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Abstract - Health information is fundamental during an outbreak, but viral speculation can easily bury the limited information we have, notwithstanding the scientific community is making huge progress in understanding the Covid-19 infection and the World Health Organization (WHO) and other organizations are making a concerted effort to counter the infodemic and conspiracy theories (WHO 2019). A case in point is *Coronacast*, a podcast aimed at "break[ing] down the latest news and research to help [the Australian public] understand how the world is living through the pandemic". In order to see whether its aim was met, the podcast hosts' discourse during their daily episodes was examined through a cluster, collocation and concordance analysis to identify the possible presence of the CONSPIR tactic (Lewandowsky, Cook 2020). This tactic includes 7 traits of conspiratorial thinking characterized by Contradictory Logic, an Overwhelming Distrust of official explanations seen as Nefarious Intent to endanger people, and a conviction that Something Must be Wrong. Moreover, according to this tactic, the hosts would speak of themselves as Persecuted Victims, their narrative would be Immune to Evidence, and they would reinterpret Random Events as if they were woven into broader, interrelated patterns. Finally, this study added two more letters to the CONSPIR acronym – AC – as it examined whether the two podcast hosts express uncertainty in Anxious or Cognitive ways. This analysis seems to open the way for a better evidence-based understanding of the powerful impact of the ideological dimension of words being inculcated into Australian society's belief system by emergent institutions such as podcasts.

Keywords: corpus linguistics, Covid-19 conspiracies, dis/misinformation, media psychology, uncertainty

1. Introduction

The Covid-19 pandemic and the fear and uncertainty it has triggered have created an ideal breeding ground for conspiracy theories (European Commission 2021), resulting in hesitancy to vaccinate and outright rejection of protocols to contain the spread of the disease (Earnshaw *et al.* 2020). On a broader scale, conspiracy theories have also been shown to increase political

[1] Although this research was jointly conducted by both authors, Matthew Groicher is responsible for sections 1, 3.3, 4.2, 5; Rosita Maglie for sections 2, 3.1, 3.2, 4.1.

apathy (Uscinski, Parent 2014), reduce trust in government institutions (Einstein, Glick 2015), and increase the likelihood of engaging in counter-normative behaviour (Jolley *et al.* 2020). Furthermore, conspiracy theories can cause intergroup difficulties and increase stigmatization of certain groups of people (Jolley *et al.* 2020), and accelerate the process of radicalization by reinforcing the "othering" of outgroups (Bartlett, Miller 2010). Conspiratorial thinking, or the "tendency to accept conspiratorial explanations", is considered the most important variable in predicting belief in conspiracy theories. This empirically documented trait varies across individuals, i.e., people tend to believe in conspiracy theories in varying degrees depending on how pronounced their level of conspiratorial thinking is (Lantian *et al.* 2020). In the medical field, belief in conspiracy theories and misinformation has led to a "dark renaissance" of vaccine-preventable diseases based on the erroneous belief that the diseases are false, or the vaccines are dangerous (Grimes 2020).

Social media and the internet have played an important role in the spread of misinformation (i.e., unverified information with no legitimate source) and disinformation (i.e., intentionally misleading information) (Tran *et al.* 2020) during the Covid-19 pandemic. Social media presents users with the opportunity to access a wide variety of facts and opinions, but can also provide a platform for the spread of rumours and other fake news, including moral panic theories (Baker 2001; McEnery *et al*. 2000 McEnery 2006), and conspiracy theories (Del Vicario *et al.* 2016). Unfortunately, many people do not have the knowledge or literacy to discriminate between fact and fiction in the news they hear and see online (Scherer, Pennycook 2020). Older adults for instance, tend to share misinformation more often than younger adults because they have lower digital literacy skills and are therefore less able to identify reliable online sources (Brashier, Schacter 2020).

Clearly, we need an approach that helps us identify conspiratorial messages. Discourse analysis and corpus linguistics can play a critical role in determining how such belief systems are discursively constructed (Demata *et al.* 2022). Identifying the linguistic features of conspiratorial thinking can help us in this endeavour. Thus, to test this hypothesis that a message exhibiting many or all of these characteristics is likely to contain elements of conspiratorial thinking, this study focused on a specific example of communication during the pandemic: *Coronacast*, an Australian podcast, aimed at "break[ing] down the latest news and research to help [the Australian public] understand how the world is living through a pandemic" (Australian Broadcasting Commission 2021). This podcast is aired by the Australian Broadcasting Commission and is hosted by Dr. Norman Swan, a former paediatrician and well-known medical journalist, and Tegan Taylor, a health and science journalist. Due to the presence of such a prominent figure

as Dr. Swan, and the fact that both hosts are health journalists, the podcast appears to be a source of trustworthy information that can help people find answers rather than feed their anxieties, a precious commodity in the face of the uncertainty surrounding the coronavirus pandemic. An in-depth analysis of the individual lexical items of these hosts over an extended period of time should show whether this is objectively true.

Lewandowsky and Cook (2020) have outlined seven traits that characterize conspiratorial thinking, summarised in the acronym CONSPIR (Figure 1).

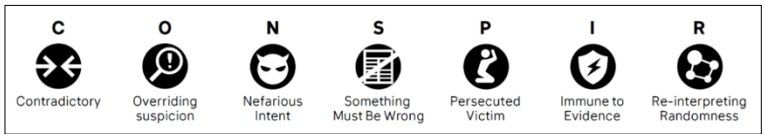

Figure 1
CONSPIR categories (Lewandowsky, Cook 2020).

- The first characteristic is the Contradictory nature of this type of thinking. Conspiracy theorists can believe in multiple contradictory ideas at the same time due to their intense commitment to disbelieving the official account, regardless of whether or not their belief system is incoherent.
- Overriding Suspicion, the second characteristic, refers to the scepticism they hold towards the official account of events. This suspicion causes them to disregard and deny any ideas that go against their beliefs, considering them a part of the conspiracy.
- The third characteristic is the belief that there is Nefarious Intent behind the motivations of presumed conspirators.
- The idea that Something Must be Wrong represents the fourth trait, and conspiratorial thinkers hold onto this idea even when their more specific theories become untenable.
- As the fifth characteristic, conspiracy theorists often consider themselves to be Persecuted Victims and courageous heroes, both targeted by, and fighting against the perpetrators of the conspiracy.
- Immunity to Evidence is the sixth characteristic, and conspiratorial thinkers tend to believe that all contradictory evidence must be part of the conspiracy. Stronger evidence against the perceived conspiracy merely indicates a stronger desire to remain undiscovered by the imagined perpetrators.
- The seventh and final characteristic is that they tend to Re-interpret Random events as being connected to the conspiracy.

These characteristics help make the conspiracy theory extremely resilient (Lewandowsky, Cook 2020). The CONSPIR tactic has proven to be an effective tool in linguistics. It has already been used by one of the two authors to detect Covid-19 conspiracy theories in the Spotify podcast *The Vaccine Conversation*[2] (Maglie 2022) and was therefore used as an approach for this study.

Moreover, one of the key drivers of conspiratorial thinking, as outlined by Douglas *et al.* (2017), is uncertainty. The need to decrease uncertainty can push people to accept conspiratorial explanations, especially in stressful or novel situations when there is a lack of information. Van Prooijen *et al.* (2020) emphasize the distinction between Anxious and Cognitive Uncertainty.

- Anxious Uncertainty (uncertainty as an anxious emotional experience), associated with an intuitive thinking style, is usually generated following threatening and consequential events and has been found to be an important driver of conspiracy beliefs.
- Cognitive Uncertainty (uncertainty due to lack of information), on the other hand, tends to associate with analytical thinking and as such has not been associated with increased conspiratorial thinking.

The authors of this research argue that since it has been demonstrated that anxious uncertainty can fuel conspiratorial thinking, the presence of a large number of phrases that evoke anxious uncertainty could be another warning sign that an information source supports or even instigates conspiracy theories. In contrast, if the source contains mainly cognitive uncertainty, it should not have a similar effect. In so doing, this research not only built on the foundation laid by Lewandowsky and Cook (2020) and the CONSPIR traits they analysed, but examined two additional characteristics: Anxious and Cognitive Uncertainty. The addition of these two types of uncertainty expands the original acronym to CONSPIRAC.

Specifically, this study investigated whether a cluster-based analysis (Moisl 2015) can identify linguistic structures that can serve as indicators of conspiratorial thinking in publicly disseminated news, in order to detect this type of news in the media. If common linguistic styles used by conspiracy theorists can be identified, they may be useful in increasing media literacy and critical thinking about the messages we read or hear online. Furthermore, since these messages may not always be intentional, learning more about the types of statements that fuel conspiratorial thinking and uncertainty could help reporters, journalists, and others who are responsible for relaying

[2] https://immunityeducationgroup.org/podcast.

reliable information to the public, to avoid using these types of speech. For this reason, the following research questions were addressed:

- Can a cluster-based analysis locate segments of text that contain characteristics of conspiratorial thinking? And if so,
- Which linguistic structures indicate traits of conspiratorial thinking in the corpus?
- Does the corpus contain a significant number of segments that express anxious uncertainty or cognitive uncertainty? And if so,
- Which linguistic structures are used to indicate different types of uncertainty?

2. Materials and methods

This research was carried out through a combination of techniques taken from corpus linguistics and psychological analysis. Corpus methods offer systematic means for pinpointing repeated and unique linguistic patterns in text and talk (Baker 2006, 2010; Baker, McEnery 2015; Leech 1991; McEnery, Wilson 2001) useful for identifying common and more singular representations of CONSPIRAC tactics. The corpus was created from the transcripts of the Australian podcast *Coronacast*.[3] At the time of corpus compilation, *Coronacast* contained 329 episodes (3.3.2020 to 30.6.2021), each of which had a duration of roughly ten minutes.

To create a sizeable corpus (Flowerdew 2004), it was decided to download transcripts of episodes of *Coronacast* from the first available transcript (2.4.2020) until the one-year anniversary of the declaration of the pandemic (11.3.2021). This resulted in a corpus of approximately eleven months' worth of episodes (235 episodes), containing 473,730 words. The analysis presented over the course of this work is based upon three established analytical perspectives on corpus data: wordlist, cluster extraction (i.e., groupings of 3 words frequently observed together) and manual analysis of concordance lines, each of which was conducted using *WordSmith Tools*, version 7 (Scott 2016). Additionally, the details page of each episode was examined for links to scientific articles or other resources as well as the presence of expert guests. This was done in order to acquire more information on the reliability of the news provided, and investigate the hosts' tendency to consider the existing literature valid, contributing to the evaluation of the category Immune to Evidence.

[3] https://www.abc.net.au/radio/programs/coronacast/ (30.6.2021).

Using the WordList function of WordSmith Tools, it was possible to visualize a list of all words present in the corpus, as well as their frequencies. Only words with a frequency of 400 or more were considered for this study. Words of interest were selected based on relevance to the theme of Coronavirus (*COVID*, *COVID-19*, *virus*, *disease*, *coronavirus*, *vaccine/vaccines*, *spread*, *test*). In addition, other words were selected based on their common usage in phrases to express opinion and knowledge or lack thereof (*think*, *know*), phrases that express contradictory information (*but*, *don't*), phrases that refer to relationships between groups of people (*we*, *they*, *us*, *them*, *people*), and phrases that refer to potential dangers (*risk*). These words were used as node words for the cluster analysis. The final list of words included in this study is shown in Table 1.

WORD	RAW FREQUENCY	% OF TEXT	WORD	% OF TEXT	RAW FREQUENCY
they	4891	1	*Them*	0.2	905
we	4736	1	*Us*	0.2	844
but	3968	0.8	*COVID*	0.2	775
people	3269	0.7	*coronavirus*	0.2	761
virus	2000	0.4	*spread*	0.2	723
think	1616	0.3	*vaccines*	0.1	645
vaccine	1588	0.3	*risk*	0.1	550
don't	1321	0.3	*disease*	<0.1	471
know	1262	0.3	*test*	<0.1	400
COVID-19	1100	0.2	TOTAL WORDS		473,730

Table 1
Words analysed.

To perform the cluster extraction, each selected node word was analysed using Wordsmith Tools Concordance function, in order to identify the three-word clusters present for each word. This study concentrated on three-word clusters because longer clusters are "more phrasal in nature and correspondingly less common" (Biber *et al.* 1999, p. 992). All concordance lines containing clusters with a frequency of 30 or more were analysed for the presence of traits of conspiratorial thinking, with the exception of the word *people*, which was found to have a relevant cluster with a frequency of 24. For this reason, it was decided to analyse all existing clusters for the word *people*. When clusters were identified, the words *test*, *spread*, *us*, *coronavirus*, and *don't* were excluded from the analysis. Neither *test* nor *spread* had clusters with a frequency of 30 or more, and while *coronavirus* and *us* had a small number of clusters above the desired frequency, none were considered relevant. It was decided not to include *don't* in the analysis because it was already present in clusters with other node words examined and thus did not introduce any new information into the analysis. The remaining words formed the base for the analysis of the clusters and concordances. The concordance lines of each cluster were searched for

indications of the CONSPIR categories outlined by Lewandowsky and Cook (2020) and Anxious or Cognitive Uncertainty**.** This resulted in a total of 9 categories that a given segment of text could fall under: Contradictory Beliefs, Overriding Suspicion, Nefarious Intent, Something Must be Wrong, Persecuted Victim, Immune to Evidence, Re-interpreting of Randomness, Cognitive Uncertainty, and Anxious Uncertainty. Identified segments of text were recorded and categorized in the corresponding CONSPIRAC category.

Clusters that were found by the program, but that only contained two words, or clusters that were irrelevant for the purpose of this study were not included. For example, the cluster *"Norman Swan we"* was not included in the analysis of *we*, even though there were 64 concordance lines that included that cluster, as *Norman Swan* corresponds to the segment of text that introduces that host talking.

The next step, manual analysis of concordance lines, combined quantitative and qualitative approaches, allowing for a greater understanding of the meaning of words in the context in which they were used (Baker 2006). One disadvantage of using concordances is that although they allow for an examination of words in their original context of use, the contextual information is confined to the few words surrounding the words or clusters (Harvey 2012, 2013). For this reason, the analysis was extended to the entire paragraph/text the clusters were found in. For each identified cluster, all concordance lines were manually analysed. If, based on this analysis, the authors found indicators of one of the CONSPIRAC categories, the entire paragraph in which it appeared was examined to find more contextual information. This made it possible to confirm the suitableness of the categorization.

Finally, a central theme was identified for each text segment, which was more specific than the CONSPIRAC category, with the aim of individuating the target of the conspiratorial thinking. The segments were then sorted both by common theme to identify the frequency of their occurrence within the corpus as well as by date to create a diagram of the prevalence of these themes over time.

3. Results

Out of a total of 236 episodes, 50 (21.19%) included links to verifiable sources directly on the page for each episode, while 16 of the episodes (6.78%) included the presence of an expert guest. For example, the episode from 3.4.2020 had two references linked. The first was a news article in *The Conversation*, a news provider that claims to offer "research-based news and analysis" (The Conversation Media Group Ltd. 2021), while the second was a research article in the *Medical Journal of Australia*, used to support the

argument in favour of a short, sharp lockdown. As an additional example, on 14.4.2020, the podcast had Professor Ian Hickie, the co-director at the Brain and Mind Centre at the University of Sydney, as an expert guest to speak about mental health issues. Only one of the examined episodes had both resources and an expert guest [23.2.2021].

3.1. Frequency of clusters and CONSPIRAC categories

The ten most frequent clusters in the corpus are shown in Table 2, and the ten clusters which most frequently indicated characteristics of CONSPIRAC in Table 3.

CLUSTER	RAW FREQUENCY
of the virus	278
and I think	206
the people who	200
people who are	200
that they are	187
and they are	185
they are not	179
I think that	138
that we are	138
so I think	124

Table 2
Top ten most frequent clusters.

CLUSTER	CONSPIRAC TRAITS
we don't know	36
just don't know	17
you don't know	15
I don't know	12
and I think	9
I don't think	8
people coming in	8
the risk is	6
don't know where	6
the Pfizer vaccine	6

Table 3
Top 10 clusters representing the CONSPIRAC categories.

The most frequently used cluster by far was *"of the virus"*, with 278 instances. Interestingly, and perhaps more importantly, based on the analysis of concordance lines, none of these clusters was included in a context that indicated a trait of conspiratorial thinking. In fact, the only cluster in this list that was used frequently enough to be analysed in concordance lines that indicated conspiratorial thinking was *"and I think"*, which was found to indicate these traits 9 times (Overriding Suspicion=5, Something Must be Wrong=4) out of 206 instances in the corpus. *Think* is the node word most

often used in these high-frequency clusters, being present in 3 out of the 10 in Table 2.

Focusing on the clusters that were used with CONSPIRAC traits (Table 3), there is once again a cluster far ahead of the others: *"we don't know"*. This cluster was used 36 times in sentences that were of interest to this study. Upon closer examination, this cluster was used 25 times in sentences indicating Cognitive Uncertainty, 10 times in those indicating Anxious Uncertainty, and once in a sentence indicating Overriding Suspicion. Even a cursory glance at Table 3 will reveal that *"don't know"* is the most popular 2-word sequence used in segments that indicate conspiratorial thinking, being present in half those listed.

Several CONSPIRAC categories emerged as being prevalent over the rest (Table 4). The most represented characteristic of those examined was Uncertainty, predominantly Cognitive Uncertainty, with 61 instances. Cognitive Uncertainty was primarily indicated by the two clusters *"we don't know"* (25 occurrences [o.]), and *"just don't know"* (11 o.). Anxious Uncertainty was roughly half as frequent as the cognitive variety and was mainly indicated by the cluster *"you don't know"* (12 o.). The second most frequent trait was Overriding Suspicion, and the cluster that was most often associated with suspicion was *"people coming in"* (8 o.). The final relevant trait was Something Must be Wrong, with 47 instances in the corpus. The clusters present in sentences that indicated this characteristic were various, and no single cluster particularly stood out from the rest. The node word that stood out, however, was *vaccine*, which was included in 15 of these clusters.

TRAIT FREQUENCY	
Contradictory Beliefs	0
Overriding Suspicion	53
Nefarious Intent	1
Something Must be Wrong	47
Persecuted Victims	8
Immune to Evidence	0
Re-interpreting Randomness	0
Anxious Uncertainty	33
Cognitive Uncertainty	61

Table 4
Frequency of CONSPIRAC categories.

The categories of Contradictory Beliefs, Immune to Evidence and Re-interpreting Randomness were not found to be indicated by any of the clusters analysed. Only the cluster *"and what they"* was found to indicate Nefarious Intent, and only eight showed indications of the speakers referring to themselves/their group as Persecuted Victims or brave heroes. The latter

category did not seem to be associated with any one cluster more than others, but the node word *people* was the one most frequently used in sentences of this type (4 o.). Consequently, 4 out of 9 CONSPIRAC categories were unable to be analysed due to their low frequency in this corpus.

3.2. Prevalent themes

Based on the in-depth analysis of the contexts in which each cluster of interest was inserted, several common themes emerged.

3.2.1. Overriding Suspicion

For the category Overriding Suspicion, the emergent themes were *suspicion of people from outside Australia* (13 instances), *vaccine-related suspicion* (8 instances), and *suspicion of the Victorian Government* (Victoria is an Australian state) (8 instances). Figure 2 shows the changes in frequency of the prevalent themes for this category over the period examined.

The most prominent theme is clearly *suspicion of people from outside Australia*, as indicated by the following examples (clusters italicized):

(1) [T]here could be [virus circulating] because you've got *people coming in* from overseas. [Coronacast, 25.12.2020]
(2) We are bringing in *people from overseas* with coronavirus, this is going to occur and it's going to occur in all jurisdictions […] this is now going to be part of Covid life moving forward. [Coronacast, 4.12.2020]

This theme seems to be present from June 2020, about four months after the beginning of the pandemic, to the end of the period examined. This message is, therefore, frequently repeated throughout the entire period the corpus covers.

The second most frequent themes were *vaccine-related suspicion* and *suspicion of the Victorian Government*. Vaccine-related suspicion is indicated by segments such as:

(3) [W]e were talking about *the Oxford vaccine* yesterday and how maybe there should be more transparency around that process. [Coronacast, 15.9.2020]
(4) [T]he worry here is that *they are going* to push for emergency use authorisation [of the Pfizer vaccine], presumably earlier than the other vaccines, but the question is, is it too early to know absolutely for sure that they are safe?[4] [Coronacast, 11.11.2020]

[4] Square brackets are used in the examples to clarify the meaning of the phrase due to lack of context available in the quotation.

This suspicion seems to come into play towards the middle of September 2020, and wane over time, with no examples present near the end of the period examined. A similar phenomenon is observable with the instances of *suspicion of the Victorian government*, which emerges in mid-July 2020, and seems to end by October 2020. Some segments exemplifying this theme are:

(5) *I think we* need to call upon Victoria to be much more transparent about their numbers [of healthcare setting transmissions.] [Coronacast, 21.8.2020]
(6) I suspect some data are being hidden from us [by the Victorian government] and *we don't know*. [Coronacast, 24.8.2020]

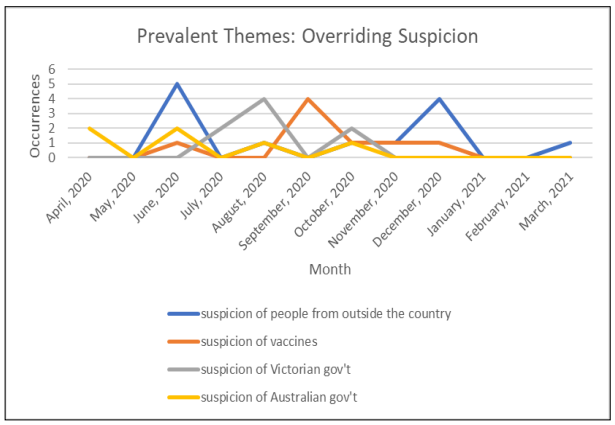

Figure 2
Frequency of the prevalent themes for Overriding Suspicion over time.

3.2.2. Nefarious Intent

Only one of the clusters analysed was found to be included in a sentence expressing nefarious intent: *"and what they"*. This cluster was included in a segment of text that accused Oxford-AstraZeneca of withholding information about their vaccine trials.

(7) *And what they* did in this press release was really naughty. They gave an average of 70% but it was an average over two separate trials. You can't do that, you cannot average two separate trials with different objectives, different doses and so on and say your average was 70%, and you can only assume that what they were trying to hide was that the full dose trial which was the larger of the two was actually quite disappointing." [Coronacast, 25.11.2020]

3.2.3. Something Must be Wrong

Moving on to the next relevant category, Something Must be Wrong, two themes emerge (Figure 3): *something must be wrong with the vaccine*,[5] and *something must be wrong with the way the pandemic is being managed*. The former is the most frequent, and is indicated by 18 text segments, including the following clusters:

(8) *But we are* hearing that some people in Norway, some very frail, elderly people have died, a larger number than you'd expect, after getting this vaccine. [Coronacast, 18.1.2021]
(9) *[T]he Pfizer vaccine* has some question marks around allergic reactions in some people. [Coronacast, 26.1.2021]

This message seems to begin in September 2020, and become stronger towards the beginning of December, ending abruptly in the new year with no examples present after February 2021.

The theme that *something must be wrong with the way the pandemic is being managed* is not very strong, being indicated by only 6 segments of text. It appears to be mostly present towards the beginning of the pandemic (May 2020) and seems to wane and disappear by November 2020. Some examples of this trait are:

(10) I think it's a really good question *and I think* there is a clear double standard [regarding safety measures for people found positive for covid inside the country and those arriving in the country]. [Coronacast, 2.9.2020]
(11) You can see why states want to protect the resources of their health departments and protect the people that live in there, *but it* [border closure] *does* seem like quite a blunt instrument to control spread when you think about the size of the states that we have at Australia. [Coronacast, 26.11.2020]

[5] The instances considered referred to all vaccines, it was not an objective of this particular study to compare the suspicion facing different vaccines, although it would be an interesting topic for a future study.

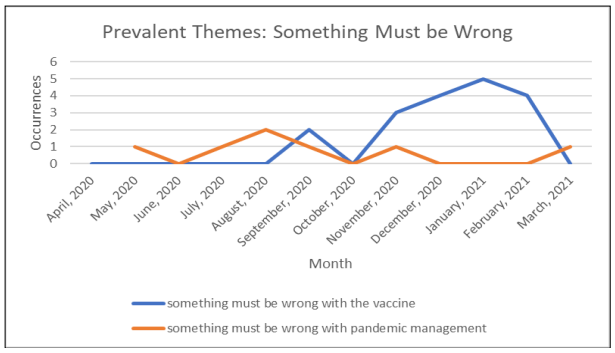

Figure 3
Frequency of the prevalent themes for Something Must be Wrong over time.

3.2.4. Persecuted Victim

This category was sparsely represented in the corpus, with only 8 instances being found. However, examination of the few instances present revealed the possibility of identifying a theme: *we are victims because other countries are hoarding vaccines*. Four segments of text carry this theme, including:

(12) [I]t's every country for themselves. That has been the failure of the pandemic so far, and you've got countries out there like Singapore and others hunting to actually buy up stock in advance in *the vaccines that* to them look most promising, and there is no guarantee that we will get stock. [Coronacast, 22.7.2020]

Three of these segments are from the same episode, and the phrase "vaccine nationalism" is used in both episodes containing instances of this theme. In the episode from July 22, the host repeatedly states that "it's every country for themselves".

3.2.5. Anxious Uncertainty

The next category is that of Anxious Uncertainty, from which emerged a singular theme (Figure 4): *uncertainty about unknown spread of the disease*. This theme was indicated by 26 segments of text, such as:

(13) That's a lot of virus circulating in Victoria where *you don't know* where it's going, who it's circulating amongst and where it's going to pop up next. [Coronacast, 3.8.2020]
(14) It has already spread to somebody else, so in other words another secondary or tertiary spread, *we don't know* how far the chain goes with this particular person, but it has already spread to somebody else. So the virus is out there in greater metropolitan Sydney. [Coronacast, 24.12.2020]
(15) [W]hether there was a super spreader or it was just a behavioural breach because there wasn't social distancing, *we don't know*. But it just shows you

how fragile our protection against this virus has become. [Coronacast, 14.7.2020]

(16) So any person anywhere in Western Australia with the slightest symptom "cough, cold, sore throat, fatigue, even fatigue and diarrhoea" has to be tested because it could be circulating and *you don't know* it, and if you are not getting tested, you could find out too late [Coronacast, 17.7.2020]

This theme seems to be present from the end of May 2020 to the end of December 2020, with the heaviest concentration in July and August 2020.

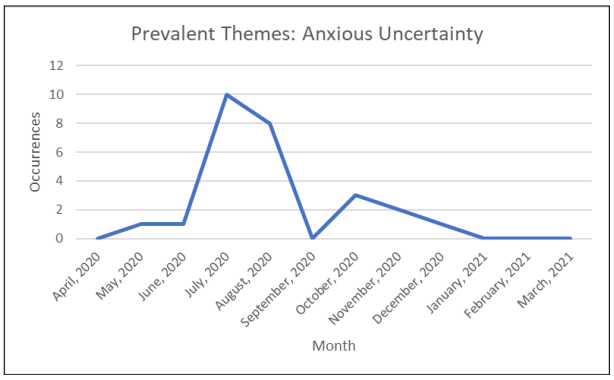

Figure 4
Frequency of the prevalent theme for Anxious Uncertainty over time.

3.2.6. Cognitive Uncertainty

Cognitive Uncertainty was the most frequently represented category and was almost twice as frequent as Anxious Uncertainty. The example of cognitive uncertainty focused on three main themes (Figure 5): *vaccine-related uncertainty*, *virus-related uncertainty*, and *uncertainty about unknown spread of the disease*. The first theme is the dominant one, and is indicated by 30 text segments, including:

(17) *[W]e don't know* yet. But there are trials going on to see whether BCG immunisation can actually protect you against COVID-19. [Coronacast, 13.5.2020]

(18) We're going to have to wait until all the data are analysed because some [vaccines] may well be better in older people than others but *we don't know* that yet. [Coronacast, 27.11.2020]

(19) I think that the lack of antibodies, *we don't know* what that means and we won't know what that means until we've looked at reinfection rates and the results of vaccine trials and whether or not it really matters whether you've got antibodies in your bloodstream or no. [Coronacast, 9.10.2020]

This particular theme appears to emerge slowly in April 2020, at the beginning of the pandemic, increase in frequency by November/December 2020, and remain consistent until the end of the period examined.

Virus-related uncertainty is the second most frequent theme in this category, with 16 examples found.

(20) *[W]e don't know* whether having the antibodies means that you are immune to a second infection [Coronacast, 8.5.2020]
(21) It's a very good question [whether people with COVID-19 need to be isolated from one another] which *I don't know* the answer to […] there is low risk of harm I imagine. [Coronacast, 7.4.2020]

This theme seems to have an opposite pattern to that of *vaccine-related uncertainty*, as it appears prevalent from April to November 2020, after which it wanes significantly.

The final emergent theme for this category was *uncertainty about unknown spread of the disease*, which appeared in 9 examples, and is expressed in segments such as:

(22) So there is now 14 cases in this cluster. *They don't know* where it comes from, but they think it has to be from the airport in some shape or form. They can't see where else would have come from. [Coronacast, 1.3.2021]
(23) [T]here are still cases where *they don't know* where the case came from, although that number will shrink as time goes on as they investigate and find the source. [Coronacast, 24.6.2020]

This theme appears in three different moments spread out throughout the period examined, as shown in the Figure 5 from the end of May to the middle of August 2020, from the end of December 2020 to mid-January 2021, and finally once more in March 2021.

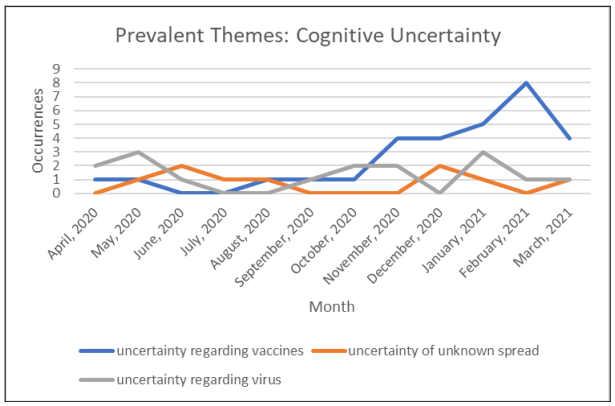

Figure 5
Frequency of the prevalent themes for Cognitive Uncertainty over time.

4. Discussion

4.1. CONSPIR categories

Based on the analysis of CONSPIR categories, the *Coronacast* podcast does not appear to significantly reinforce conspiratorial thinking. In fact, only two out of the original seven CONSPIR categories occurred frequently enough to be thoroughly analysed. These two categories were Overriding Suspicion, and Something Must be Wrong. The other categories of Contradictory Beliefs, Nefarious Intent, Persecuted Victim, and Re-interpreting Randomness were either infrequent or absent in the corpus. Since these are major aspects of conspiratorial thinking, this podcast does not appear to be a strong instigator of conspiratorial beliefs.

It has been argued that a certain level of conspiratorial thinking may actually be beneficial, as it can encourage governments to be more transparent, or even uncover real conspiracies (Swami, Coles 2010). It could, therefore, be hypothesized that the questioning of the government and its strategies, and of vaccines and the processes related to them, may be an attempt to increase communication transparency. Perhaps the most telling characteristic of conspiratorial thinking, Nefarious Intent, is almost completely absent. In fact, the only segment of text encountered which expresses any degree of nefarious intent regards the behaviour of Oxford-AstraZeneca with the reporting of their vaccine trials. While the host does accuse Oxford-AstraZeneca of withholding information, this comment seems to be an attempt to criticize the vaccine producer's methods of reporting vaccine efficacy, rather than to create vaccine fear. Although the hosts of *Coronacast* are willing to criticize and draw attention to potential governmental flaws, their strategies, and vaccines, they never go so far as to suggest they may have the intent to cause harm.

Also lacking completely are examples of Contradictory Beliefs and Re-interpreting Randomness. The hosts seem to take great care to relay information as it is received, and to correct themselves when it is revealed that previous information or interpretations were incorrect.

It is worth noting that contradictory statements are not likely to be uttered in the immediate vicinity of one another. Therefore, a limitation of the methods used in this study is that an analysis of the clusters in the text would be unlikely to reveal contradictory beliefs. It would be necessary to collect various statements pertaining to the same subjects over time and compare them to see if they eventually contradict themselves, without providing a legitimate reason, such as the emergence of novel, previously unknown information.

The hosts do not seem to jump to conclusions based on random events,

rather they follow the information as it is uncovered, expressing themselves based on the literature available at the time. The tendency to rely on scientific research is also indicated by the large portion of episodes (27.6%) that were linked to sources of information such as government websites or scientific articles, or which brought in expert guests.

Despite some comments indicating suspicion or criticism of vaccines, the hosts are very pro-vaccine, as they express repeatedly. Furthermore, when the dates in which these comments were made are considered, we can see that vaccine-related suspicion seems to die out around December 2020, about the time when vaccines started being rolled out. Statements that something might be wrong with vaccines do, however, continue until the end of February 2021 near the end of the period examined (Figure 3). It is possible that they may continue after this period, but considering the increased successful administration of vaccines, it is likely that vaccine-related uncertainty has only continued to decline.

Since only 8 instances of the category Persecuted Victim were found in the corpus, the hosts do not seem to consider themselves or their groups as victims, or to suggest they may be the only ones combatting nefarious forces. The only repeated theme, that Australians might be victims since other countries are buying up all the vaccines, was present in only two episodes, making it difficult to consider it a repetitive message.

Perhaps the most relevant instance of suspicion was that regarding people from outside the country. The message that people from outside the country were bringing in Covid-19 was prevalent throughout the entire period examined, a frequently repeated message (Figure 2). While it is true that, since Australia is an island nation, the virus would necessarily have to be brought into the country from the outside, the way this message is phrased often makes it seem as if foreigners are to be viewed with suspicion as potential carriers of the virus. The fact that it is regularly repeated may cause people to be more likely to believe this message is true (Fazio *et al.* 2015). Furthermore, the action of identifying an outgroup responsible for current problems can be linked to the social motives that drive moral panic theories (Baker *et al.* 2008) and conspiracy theories (Douglas *et al.* 2017). Therefore, this tendency seems to relay the message “People from outside Australia are the problem, not us. Be suspicious of them”. This tendency was commonplace during the Covid-19 pandemic, as leaders from various countries instrumentalized nationalism to increase solidarity among their own people, leading to resentment of those from foreign nations (Wodak 2021; Zhai, Yan 2022). Consequences of surging nationalism and suspicion of foreigners were evidenced by the increase in discrimination against people from China in particular, but responses to the outbreak disproportionately

affected migrants and people of colour all over the world (Devakumar *et al.* 2020).

To answer our research questions concerning the localization of linguistic structures containing characteristics of conspiratorial thinking, analysis of the clusters and concordance lines in the corpus found examples of CONSPIR traits, however, these were not reliably associated with any specific three-word clusters. The only cluster that seemed potentially linked to a tendency to express suspicion was *"people coming in"*, which was present 24 times in the corpus, 8 of which expressed suspicion towards people entering Australia from outside the country. It is possible that this type of analysis used with a different corpus may reveal diverse results, given that the source for this study seemed to provide reliable information. As demonstrated in a previous study (Maglie 2022), a possibility for future research could be to examine a more obviously conspiratorial source to see if there is a more frequent use of similar linguistic structures. The concordance line analysis was more successful than the cluster analysis, evidenced by the fact that this method allowed us to pick out 109 instances of language that fit the CONSPIR categories, which increased to 203 instances when the AC categories were also considered. It seems that it is necessary to combine quantitative and qualitative methods to effectively find and identify these types of speech, as language is a complex phenomenon, requiring context to be able to reliably identify the subtleties of discourse. Overall, the lemma *think* appears to be the most important node word in terms of use in CONSPIR phrases. This is unsurprising, considering *think* is the verb people most frequently use to express their thoughts and opinions, and this is where conspiratorial thinking would be likely to emerge.

4.2. Uncertainty

Analysing the text segments that expressed uncertainty, in accordance with our research questions, also painted *Coronacast* in a generally positive light. In fact, the vast majority of the instances of uncertainty were categorized as Cognitive Uncertainty, as opposed to Anxious Uncertainty. As previously discussed, Cognitive Uncertainty is not considered a driver of conspiracy beliefs, whereas Anxious Uncertainty is. The hosts try to express uncertainty, which has been a constant during the Covid-19 pandemic, in a way that transmits the message, "We don't have this information at the moment, but we're working on it." They indicate that the information will arrive eventually with phrases like "there are trials going on" (example 17), or "We're going to have to wait until all the data are analysed" (example 18). Even the simple adverb *yet* (examples 17, 18) implies that in time there will be answers to these questions.

When discussing the possibility of the virus spreading unchecked, this message acquired a more anxious tone. The majority of instances of uncertainty about this topic were expressed in an anxiety-inducing manner. The use of phrases such as "the virus is out there" (example 14), or "it just shows you how fragile our protection against this virus has become" (example 15), are likely to evoke feelings of nervousness and anxiety in listeners, causing more fear as to "where it's going to pop up next" (example 13).

A secondary phenomenon that emerged when analysing Cognitive Uncertainty was the way that virus-related uncertainty was high at the beginning of the period examined and diminished over time, which seems logical considering coronavirus is a novel disease about which we acquired more information over time, reducing uncertainty. The opposite was observed when considering vaccine-related uncertainty, which began slowly but became quite prominent towards the end of the period examined, coinciding with the mass administration of vaccines. It therefore seems that vaccine-related uncertainty was expressed in an increasing degree throughout their development. It could be hypothesized that this uncertainty will likely decrease in the coming months, as the effects of mass immunization are observed, and the vaccines are given to more and more people.

Looking at clusters, *"you don't know"* or *"you just don't know"* were more frequently associated with Anxious Uncertainty, whereas *"we don't know"* was more commonly used to express Cognitive Uncertainty, providing information without emotion-evoking phrases. Since *we* is a collective pronoun that includes the speaker, it could refer to all Australians, including the hosts, but occasionally seems like it may refer only to the scientific community (examples 18, 19). For example, in example (19), it is clear that the scientific community, not the average citizen, will be looking at the results of vaccine trials and reinfection rates. *You*, while also used collectively, is frequently used to refer to people in general (i.e., it is an impersonal construction), potentially excluding the speaker, and in this case seems to be used to speak about the Australian public (examples 13, 16).

You almost seems to tell the public "Watch out, because you don't know where the virus is or who might have it". It instils suspicion and fear, rather than only conveying information. The words "you could find out too late" (example 16) are particularly fear inducing, conveying a sense of panic, as if there might be a time limit before disaster strikes. We can also see a possible instance of blame here, as "if you are not getting tested" (example 16), which again uses *you* to collectively refer to the public, implies that a large part of the population may not be behaving as they should be, according to the hosts.

This implicit differentiation creates a divide between the general public and the scientific community, subtly indicating the former as the reason for the unknown spread which they should fear. While the analysis of clusters was unable to locate a pattern in the language used in *Coronacast* for the original seven CONSPIR traits, it was able to draw out this peculiarity in the usage of *"we don't know"* vs. *"you don't know"* when speaking about the virus outbreak and uncertainty. It would be interesting to see if this tendency to implicitly differentiate between the general population and the scientific community is also present in other sources of health information, and whether or not those sources use language that contains traits of conspiratorial thinking.

To respond to our research question regarding the types of language used to indicate uncertainty, the most relevant lemma for the AC categories was *know*. When used in conjunction with *we*, this verb seemed to frequently refer to the scientific community and favoured Cognitive Uncertainty, creating the image of a search for answers to the many questions we all have during these trying times. When used with *you*, however, it appeared to take on a more anxious tone and to refer more frequently to laypeople, and create a feeling of anxiety about the spread of the disease and fear of new outbreaks (Anxious Uncertainty). The way the hosts speak about what they know appears to be key in determining the tone of the uncertainty they express. Since uncertainty and doubt are some of the key motivators that push people to turn to conspiracy theories (Douglas *et al.* 2017), it is vital to avoid creating more anxiety and confusion when issuing health information. As such, these findings could be useful to those who have the responsibility of distributing this information.

As a final note, the analysis of the podcast's use of resource materials, as well as recent research by Maglie (2022), raises the question of a potential additional trait of conspiratorial communication: Indeterminacy. This trait is explained as the "reference to studies or to research that cannot be easily or exactly identified". It seems to be a habit of this type of communication, referring to *research* or to *sources* without providing specifics of those sources. For instance, Maglie (2022) refers to another podcast, *The Vaccine Conversation*, in which the host, Dr. Bob, frequently speaks about having *data* without providing a verifiable source of this information. While this was not a problem in *Coronacast*, it could be an interesting subject for future research. The addition of this trait would create a new acronym: CONSPIRACI. This updated acronym includes the two types of uncertainty examined in this study, as well as Indeterminacy. It should be noted that, although the letter A is also included in Maglie's research, there it represents a different characteristic, that of Semantic Approximation, used to suggest that podcasters' opinion differs to some degree from the official account,

which is seen as deceptive and therefore criticized (Maglie 2022).

5. Conclusions

This study has examined a large corpus made from the transcripts of a single podcast over the course of nearly a year of the Covid-19 pandemic. The application of a text analysis focused on clusters allowed us to examine such a large quantity of text in a relatively short amount of time. This was done with the objective of isolating specific patterns in the language used by the hosts indicating traits of conspiratorial thinking. These traits were defined using the acronym CONSPIRAC, derived from a combination of conspiratorial thinking categories proposed both by Lewandowsky and Cook (2020) and by the authors. It was found that among the three-word clusters examined, specifically those including the node word *know* were frequently used to express uncertainty. The anxious uncertainty expressed by the hosts seemed to focus on the spread of the disease, inciting fear in listeners. The frequent repetition of this message may resonate with those who tend towards a more conspiratorial thinking style, making them more susceptible to conspiracy theories. There also seemed to be a slight difference in the use of *we* vs. *you* in these clusters, pointing towards an unconscious tendency to differentiate between the scientific community and laypeople. This division, however subtle, may implicitly make scientists and other health authorities part of an out-group who are the only ones who possess information, leading to suspicion and resentment from a fearful population that becomes more likely to turn to conspiracy theories to reduce uncertainty and feel safe.

Despite these criticisms, the podcast examined, *Coronacast*, generally appears to do a good job relaying information, and with a few minor adjustments, can easily avoid those types of messages encouraging conspiratorial thinking.

The type of analysis performed does appear to have limitations, in that some of the CONSPIRAC categories were not easily found through a cluster analysis. Further research would be necessary to see if some adjustments of this method could be more effective in finding these types of language.

The hope is that this information can be useful for research into the topics of conspiratorial thinking, conspiracy theories and misinformation. Hopes are also high that these findings can be useful in making people less susceptible to the effects of misleading messages and conspiracy theories in the media, as well as helping information providers to better communicate information in a way that does not encourage the belief in or the formation of conspiracy theories. In this research we have seen how certain ways of speaking can confer specific ideas, sometimes independently of the intended

message. This is most obvious when it comes to expressing uncertainty. While it is clear the Covid-19 pandemic is a situation in which uncertainty is widespread and unavoidable, the way we express this uncertainty in media, which can reach enormous numbers of people, is vital to the prevention of the spread of conspiracy theories.

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