



Section 3: **Applied linguistics and public health**

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Chapter 5

Modality and interpretative spaces in policies

1 Introduction

Since its inception in the 1960s, language policy and planning (LPP) has continued to evolve. LPP is an applied linguistic research domain focusing on policies regulating language use (Fishman, Ferguson, and Das Gupta 1968). One particular development in the area is the growing presence of scholarship examining health care policies in language policy publications (Schuster, Elroy, and Elmakais 2017; Martinez 2008; Higgins 2010; Ramanathan 2010). Digital advances in data gathering provide an opportunity for applied linguists to integrate collaborative corpus-assisted approaches. These advances aim to explore large-scale discourse data and broaden the scope of LPP research beyond examining language policies towards scholarship analyzing the very language of policies. The goal of the chapter is to outline and apply a systematic, applied linguistics framework – corpus-based discourse analysis (CBDA) – for use in LPP research on health policy. The study presented in this chapter explicates that framework, using CBDA to understand the functions that grammatical features serve in the framing of public health policies.

The first half of this chapter treats LPP and introduces the linguistic theory that grounds my CBDA approach, while the second half reflects on the analysis of a previous study, in which I used CBDA to analyze the roles of modal verbs in framing policies (see Torres 2021 for more detailed discussion). Modality (i.e., verbs like can, will, shall) is a popular choice for framing policies and any other discourses referencing future events because they can communicate attitudes, truths, and stances displaced in space and time (Bhatia, Flowerdew, and Jones 2008; Hacquard 2016; Portner 2009). However, modals can also cause confusion and ambiguity due to their polysemic quality (Asprey 1992; Garzone 2013). American policymakers' excessive use of modals, despite their potential to pose problems for stakeholders tasked with interpreting and carrying out such policies, is a source of curiosity that motivates the investigation presented in the sample study. Specifically, the sample research answers the following research question: *What functions do modal verbs*

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serve in shaping California opioid policies? Finally, the chapter concludes with a reflection on the potential contributions applied linguists and CBDA could make to advance LPP studies in the context of public health policies.

2 Part I: Linguistic theory

2.1 Situating the study: From language policies to language of policies

Applied linguists interested in policy research face the challenge of situating their work within a field that already considers LPP as one of its well-defined research domains. Language policies, in broad terms, refer to guidelines regulating language use in communities. The first wave of scholarship in the 1960s focused primarily on the codification of national languages, when standardization was regarded as a solution to establishing a unified sense of identity among coexisting communities (Haugen 1959, 1983; Fishman, Ferguson, and Das Gupta 1968). Although not necessarily ill-intentioned, these policies come with top-down solutions that ultimately limited how people think, communicate, and identify themselves (Noss 1967; Das Gupta 1970).

“Critical language policy” emerged in the 1990s, as scholars in the domain began criticizing language policies and their historical and structural mechanisms for causing linguistic inequalities (Fowler 1979). The movement eventually catapulted LPP research towards investigating local policy enactments in areas such as schools and the workplace as researchers began confronting the interpretive nature of policies (Pérez and Nordlander 2004; Levinson, Sutton, and Winstead 2009; Hornberger and Johnson 2007). According to Johnson and Freeman (2010:15), policies can be interpreted and understood in different ways by stakeholders who “appropriate, resist, or change dominant and alternative policy discourses.” For instance, Ricento and Hornberger (1996) investigated the role of English instructors as language policy arbiters in the classroom and revealed the discrepancies in the interpretation and enactment of policies. Similarly, Johnson (2012) examined the stakeholders’ diverging interpretations of Arizona’s language education policy, Proposition 203, to illustrate how interpretation influences stakeholder response. As Hornberger (1998) explained, ignoring the effect of policies discounts the agency of the very people in charge of linguistically interpreting them. Johnson and Freeman (2010) presented the concept of “spaces” within which teachers – the stakeholders in their study – negotiate various possible interpretations of education language

policies (see also Menken and Garcia 2010). This concept inspired the notion of “interpretive spaces” introduced later in this chapter.

Incorporating ethnographic and discourse analytic approaches to LPP opened up the domain to the investigation of the language of policies instead of simply “language policies” per se. As Davis (1999) explained, the field has done more than simply establish national languages. In fact, the field has increasingly addressed the language of healthcare policies. Stritikus and Wiese (2006) highlighted health policy interpretation and enactments as a possible direction for future studies in a paper about bilingual education language policies. Moreover, in a special issue of *Language Policy*, Ramanathan (2010) advocates the importance of addressing ‘language’ and ‘policy’ concerns separately instead of as a singular unit in order to address both language and (public) policy concerns around health. Higgins (2010) took up the challenge by examining the language of international public health policies while simultaneously evaluating the linguistic means in which such policies are interpreted in local HIV/AIDS educational sessions in Tanzania. She revealed the tensions between global and local cultural models, demonstrating the need for policymakers, health care practitioners, and applied linguists to collaborate on solutions. Martinez’s (2008) ethnography at the U.S.-Mexico border exposed how the language of federal healthcare policies negatively impacts Spanish-speaking patients’ health outcomes despite federal policies concerning the provision of interpreter services. Finally, scholars like Ainsworth-Vaughn (1998), Ramanathan (2009), Sarangi and Roberts (2008) have sought to address critical and cultural issues around policies concerning ailments.

2.2 Policies

Applied linguists studying the language of policies also have to navigate through the many different definitions of “policy” from various academic domains. Ball (1990) and Goodnow (2017) define policies as authoritative texts and de facto practices used by governing institutions to reflect social knowledge into plans, procedures, and goals to guide local decision-making. When taken into a linguistic perspective, policies are chunks of language (discourse) made up of lexical and grammatical features that denote a suggestive intent of regulatory measures and courses of action concerning a given issue. By analyzing the emerging patterns present in policies, we can uncover policymakers’ hidden ideologies and attitudes towards the issue in question (Gales 2009; see also Stubbs 2001). The language of policies permits the investigation into the current state of the community that implements it (Wodak 2006; Ramanathan and Morgan 2007). After all, the importance of policies relies on the need that calls for it.

There are at least three diverging levels of policies informing health issues in the United States today: federal, state, and local. Each level feeds into and off of another, creating a dynamic intersecting system that informs emerging health issues. Thus, policy scholars must consider these distinctions when deciding which policies to investigate to make connections between the language of policies and local enactments.

According to the Institute of Medicine (1988), the federal government's primary role in healthcare is to fund state health initiatives. Thus, the federal government's influence in implementing change locally is limited because it is not involved in the local realization of the funds. Instead, federal institutions could only draft contracts that obligate states to take action towards a general goal. State governments are responsible for promoting the general welfare of their constituents by establishing state-level healthcare policies for local medical institutions to follow. Furthermore, local institutions such as health centers, clinics, and city hospitals, consider the guidance provided in state policies when drafting the specific mandates or guidance for their workers to follow.

The primary federal units responsible for public health issues in the United States are the Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC), and the Food and Drug Administration (FDA).

2.3 Corpus-based discourse analysis and frameworks

Corpus-based discourse analysis has been widely used in studying public and language policies because it allows for the quantitative and qualitative examination of large data (Flowerdew 2008; Partington 2003, 2008). Corpus Analysis (CA) provides a quantitative textual analysis of specific grammatical features, while Discourse Analysis (DA) allows researchers to interpret the set of possibilities that motivate and explain the patterns that emerged from CA (Baker 2006). Using DA allows policy researchers to make sense of the choices language users make. In the case of the sample study, DA helps shed light on the modal choices of policymakers that could lead to identifying their role in policies. Two relevant frameworks that could assist the analytic process are (1) context models and (2) frames.

2.3.1 Context models

Van Dijk's (1999: 131) context model framework – a schema designed to reduce the complexity of social situations and efficiently contextualize discourse through schematic categories – is an effective guiding principle for the discourse analysis

of policies because it efficiently narrows down various contextual features relevant to the analysis. The four contextual categories in Table 1 were conducive to the analytic process in the study cited in this chapter.

Table 1: Four schematic categories accounted for when designing a discourse analysis study of policies.

Category	Policy Information	Purpose (present study)	Use in policy analysis
Time	When was the policy chaptered?	To map the changes in modal usage across time.	Accounting for when policies or amendments were made enables researchers to connect local realities to the changes in the language or framing of policies.
Location	Where is the policy enacted?	To understand the correlation between local events and modal usage.	Choosing a specific area and constituency from which policies are gathered and analyzed keeps the study focused, resulting in key findings that could directly benefit the specific locality.
Participants (Policy stakeholders)	To whom are the policies addressed?	To identify the policy stakeholders (gender-neutral term for actors) who are either limited or empowered by restrictive and permissive modality, respectively.	Identifying the individuals who are expected to address social issues through interpreting language and whether they provide ample representation of the diverse groups in the locality.
Action (Policy action)	What is the policy about?	To reveal the purpose of the proposition that triggered certain modal choices.	Identifying the specific actions state and local leaders are implementing to address concerns.

2.3.2 Frames

Fillmore (1975: 123) describes “frames” as “schemata” that structure one’s understanding and interpretation of linguistic expressions and symbolic units such as text. Fillmore (1975) adds that frames are either evoked by the discourse or invoked by the “cognizer” (the receiving end of the discourse). Lastly, Fillmore (1976: 29) describes frames as empty slots within a string of words that could be filled using the information provided by the remainder of the text and applying what one knows about the situation and the world.

country came up with was to change the way medical practice addressed pain, from finding its source to directly targeting pain itself (Caudill-Slosberg, Schwartz, and Woloshin 2004). Thus, policies that came out between 1970 to 2003 were less concerned about overprescribing opioids than they are alleviating patients' pain:

- 1986: The World Health Organization (1986) released the “analgesic/pain ladder,” an international guideline which states that if cancer pain relief is not adequate, “another strong opioid drug should be tried.”
- 1990: The state of California passed the Intractable Pain Act, which stated that “no physician shall be punished for prescribing opioids for chronic pain.”
- 1992: The Agency for Health Care Policy and Research (1992) released a guideline for aggressive pain treatment to alleviate post-surgery suffering.
- 1997: California enacted the Patient’s Bill of Rights, officially supporting the use of opioids in treating noncancerous conditions.
- 1999: The American Pain Society (1999) and the Department of Veteran Affairs (2000) called for pain to be classified as a vital sign.
- 2000: The California Board of Registered Nursing (2000) required pain as one of the vital signs gathered during clinic intake. Nurses asking patients to rate their pain on a scale of one to ten has become a ritualized component of medical visits. The policy tasked nurses to take action if the patient’s pain is beyond their comfort level.

3.1.2 Phase II: Transition (2003 to 2010)

Based on the statistics presented by the CDC and HHS, the US opioid prescription rates increased substantially during this phase, averaging 81.2 prescriptions for every 100 Americans. The policies that were “chaptered” – meaning, approved by policy-makers – during this time may have started addressing issues on addiction, but there were also policies that made opioids more accessible in treating any kind of pain.

- 2004: California released Senate Bill 1838: The Alcohol and Drug Prevention Program, a blanket policy primarily focusing on addictive substances on a larger scale, targeting popular choices such as alcohol and marijuana. While the word narcotic was mentioned briefly, the policy neither mentioned nor addressed opioid addiction. That said, the policy was a declaration of the state’s focus on fighting addiction and brought life to rehabilitation programs and centers.
- 2006: California amended the 1990 Intractable Pain Act: “A physician and surgeon may prescribe, dispense, or administer dangerous drugs or controlled substances for the treatment of pain, including, but not limited to, intractable

pain. No physician shall be subject to disciplinary action for prescribing, **dispensing**, or administering **dangerous drugs or controlled substances.**” The insertion of “dangerous drugs” and the coordinating conjunction “or” right beside “controlled substance” twice in the policy imply some degree of equivalency.

3.1.3 Phase III: Opioid Epidemic (2011 to Present)

Ultimately, this era marks the beginning of a more deliberate and aggressive campaign against opioid addiction. The policies that came after 2011 were primarily focused on fighting the epidemic

- 2011: The CDC used the word “epidemic” to describe the state of opioid misuse in the country after deaths from accidental overdose exceeded fatalities from vehicular accidents (Centers for Disease Control and Prevention 2011).
- 2013: California turned the law enforcement tool, Controlled Substance Utilization Review and Evaluation System (CURES), into a prescription monitoring system.
- 2016: President Obama signed the Comprehensive Addiction Recovery Act (CARA), the first major federal legislation on addiction in 40 years and the most comprehensive effort undertaken to address the opioid epidemic.
- 2017: Physicians were required to consult CURES before prescribing opioids. The transition confirms that the opioid crisis is now predominantly a policy issue instead of a law enforcement concern.

This timeline allows us to understand where the sentiment towards opioids lies at certain points in its history. Clearly, opioids were seen as the solution to the harrowing pain epidemic, only to later become the problem needing to be solved. Figure 1 illustrates the rising opioid-related death rates in California through the three phases.

By paying attention to the emerging patterns in modal usage across the three phases, researchers can evaluate whether correlations exist between modal use and the events happening on the ground.

3.2 Modals

Policy documents are one of the most prominent and consequential outlets by which social issues are discussed (Fairclough 2003). Yet, as discussed earlier, there is a lack of research investigating policymakers’ excessive use of modality

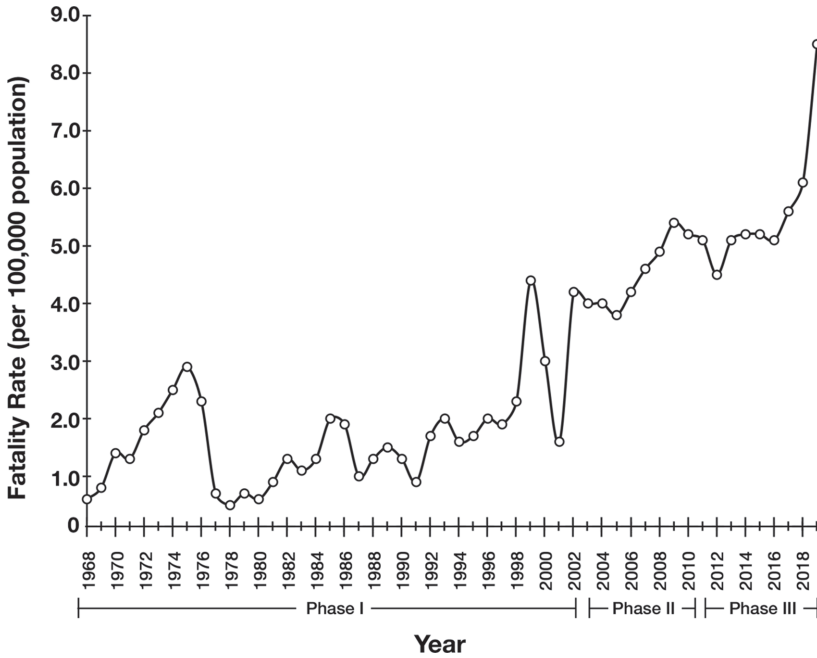


Figure 1: Number of opioid-related Fatalities in California from 1968–2019.¹

in policies, despite its well-established potential for ambiguity (see Lyons, 1977). This section provides more context on how the polysemic nature of modals could result in varied interpretations of policies.

Modals have been commonly described in linguistics through their deontic (root or intrinsic) and epistemic (extrinsic) interpretations, as summarized in Table 2 (Coates 1983; Saeed 1997; Werth 1999; Kratzer 2012).

Table 2: Deontic and Epistemic Interpretations.

Modal Auxiliary	Deontic (Intrinsic)	Epistemic (Extrinsic)
can, could, may, might	permission, ability	possibility
must, should	obligation	necessity
will, would, shall	volition	prediction

¹ Crude rates, or death rates per 100,000 population, are used when age-adjusted rates are not available. Data was gathered from the CDC WONDER database. To generate the report for opioid-related fatalities, the following International Classification of Disease (ICD) codes had to be identified: ICD-8 E853.0 for 1970–1978; ICD-9 E850.0 for 1979–1998; ICD-10 underlying cause-of-death codes: X40–44, X60–64, X85, Y10–Y14 and multiple cause-of-death codes: T40.0–T40.4, and T40.6 for 1999–2018.

Thompson (2001) was also interested in the role of modality but focused on academic writing. He argued that, although informative, the deontic and epistemic distinction offers little information about why a particular modal is chosen over a long list of alternatives. Instead of focusing on form, his investigation centered primarily on the range of rhetorical functions thesis writers aim to perform when using modals. This chapter takes on a parallel approach by examining the potential range of functions performed by modals in the genre of policy drafting, allowing us to deepen our understanding of how language is used in constructing policies.

3.2.1 Modals as a reflection of local realities

In his study of modality within political discourse, Chilton (2004: 57–59) proposed a concept called the “modal axis,” which states that people use modality to position themselves relative to their “truth,” given the circumstances in that particular space and time. “Truth,” here, could be the reality that people deem right or seek to frame as such. Using this model, the statement “*I will visit the doctor tomorrow*” has a language user employing “will” to express a high degree of confidence towards the proposition because visiting the doctor is right in their reality. Therefore, choosing a different modal, such as *may* – as in “*I may visit the doctor tomorrow*” – evokes a meaning that is farther from their truth. With modals as a grammatical feature that expresses force and realities, policymakers’ modal choices could indicate their perceptions towards the severity of local issues and the actions they seek to address them. As such, the study presented renders the concepts of “modal axis” and “realities” into a policy perspective to propose that modals mirror the seriousness of local issues.

3.2.2 Modals as permissive and restrictive forces

In their discussion of speech acts and modality, Boyd and Thorne (1969) described modals, particularly those found in imperatives, as illocutionary forces that permit and lay obligations. Talmy’s (1988) and Sweetser’s (1990) later suggestions are in agreement, referring to modals as forces that “forbid or allow” and “restrict or permit,” respectively. More recently, Chilton (2004) uses the terms “command” or “prohibit” to describe the same speech acts and argues that modal interpretation is contingent upon prevailing norms at the time of use. This study recontextualizes all speech acts mentioned into a more policy-oriented perspective; using the word “restrict” to refer to the forces that “forbid” or “prohibit” actions and “permissive” to refer to the forces that “allow” or “let.” This study draws on

modality’s ability to communicate discourses intended to “prohibit” or “permit” particular courses of action to make sense of modality’s potential role in policies.

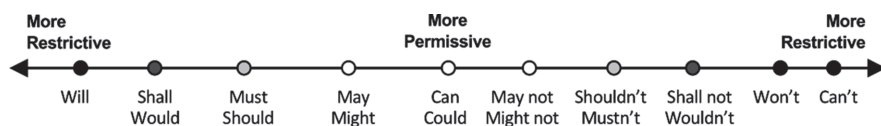


Figure 2: Modals arranged within a “Restrictiveness” and “Permissiveness” scale.²

Modals evoking the broadest range of possible interpretations are in the middle, while those intended to be perceived as most confining are found towards both ends. For example, a modal like “may” – with its speech acts that permit or allows – leaves stakeholders with the decision of acting upon a proposition, while modals like “must” carry an obligatory implication restricting stakeholders from certain actions. Thus, modals like “may” and “can” are permissive because they highlight the optionality of policies by allowing stakeholders to negotiate meaning from a broad range of possible interpretations, a quality distinct from restrictive counterparts like “shall” and “will.”

In what follows, I discuss how corpus-based discourse analysis allows for both the quantitative and qualitative assessment of policies, helpful in uncovering the role of restrictive modals like “shall” and permissive modals like “may” in policies.

3.3 Methodologies

3.3.1 Creating the corpus

A total of 223 California opioid policies enacted between 1970 and 2019 were gathered from the state’s online legislative archive using the following primary keywords: opioids, controlled substance, schedule II, and narcotic. Each result was reviewed so that all of the state’s policies concerning opioids were included. The corpus was divided into a subcorpus of original policies and another of amendments to avoid conflating frequencies. In addition, the changes in all preceding and ensuing versions of amendments were carefully compared to account for newly added, deleted, and changed modals.

² Combines the findings from key pieces of literature – including Boyd and Thorne (1969), Chilton (2004), Saeed (1997), and Werth (1999) – on the restrictiveness and permissiveness of modality.

3.3.2 Quantitative analysis

Through frequency analysis, the study tracked restrictive and permissive modal use and their correlation to the worsening opioid crisis. Modal frequencies were generated using MAXQDA, while Analysis of Variance (ANOVA), chi-square tests, and regression analysis were conducted in SPSS (Version 26). The recurrences of both permissive and restrictive modals were the dependent variables, while “time” and “fatality rates” were the predictors representing the worsening crisis. Instead of the commonly used Euclidean distance, the study detects outliers using Mahalanobis distance because it accounts for variables with different units when analyzing correlation (Divjak and Fieller 2014).

3.3.3 Qualitative analysis

This analysis uses Van Dijk’s (1999) context model framework, discussed above, as a starting point for the coding process. Specifically, the study focused on finding what Van Dijk referred to as (1) “participants” or the stakeholders to whom policies are addressed and (2) “actions” or the proposed measures to be enacted by the participants. Coders trained in discourse analysis finalized the specific categories as they emerged from the text – a process called axial coding (Strauss and Corbin 1997). This method allows for data to naturally fit into categories instead of forcing them into pre-determined groups that may not necessarily be accurate representations for the data. Tables 3 and 4 present the policy participants and actions that emerged from the sample study.

Table 3: Stakeholders addressed in California policies.

Policy Stakeholders	Example
1. State departments	Sectors of state government responsible for public health concerns. <i>i.e.</i> , California Department of Health Care Services, California Department of Justice, Drug Enforcement Administration, California Department of Social Services, California Health and Human Services Agency
2. Health care providers	Medical providers prescribing opioids. <i>i.e.</i> , Physicians, Surgeons, Dentists, Pharmacists, Paramedics, EMT personnel, Nurses, Midwives, Emergency responders, Physician Assistants, Anaesthetists, <i>etc.</i>

Table 4: Policy actions proposed in California policies.

Policy Action	Example
A. Handling pain	Policies stating who can administer opioids in health centers.
B. Prescribing guidelines	Policies on opioid prescribing, including dosage limitations and procedures for electronic prescriptions.
C. Education requirements	Mandatory certification requirement for physicians to take continuing education on the risks of opioids.
D. Oversight	Policies allowing the regulatory board to suspend licenses.
E. Diversion programs	Policies on establishing and running diversion programs.

Coding was done in tandem, which allowed coders to offer their expertise, discuss differences, and keep each other consistent (see Henry et al. 2020; Hood-Medland et al. 2021). The research is better served when everyone’s explanation is heard instead of accepting the code most coders chose, especially in highly specialized discourses such as policies and medical consultations.

Finally, the patterns that emerged from the quantitative findings helped direct the discourse analysis component of this study towards particular modal usage that warrants a more detailed investigation. Specifically, this part of the study zooms in on the amendments in which only modal verbs were changed while the rest of the clause remained constant. As part of discourse analysis, “interpreting” and “explaining” the motivations behind policymakers’ decisions to change modals concerning the severity of the crisis in the state sheds light on modality’s function in policies.

3.4 Results and Discussions

3.4.1 Modal frequency

A frequency analysis of modal verbs in California opioid policies was conducted using MAXQDA, separating the original policies from their amendments to avoid conflation (Table 5).

Table 5 reveals that “shall” and “may” are the most used modals of California policymakers in framing the state’s opioid policies. As presented in Figure 2, “shall” and “may” are found towards the restrictive and permissive sections of the modal scale, respectively. Therefore, the modal frequencies indicate a restrictive-permissive distinction taking place in the framing of policies. Referring back to Fillmore’s (1975) frame theory, language users fill empty frames with the help of the information provided by the rest of the text paired with their knowledge of the situation. Language users also qualify the set of potential entries when

Table 5: Modal Frequencies in Original Policies and Amendments.³

Original Policies <i>n=30,013 words</i>				Amendments <i>n=80,095 words</i>			
	Modal	Frequency per 100,000 words	Percentage		Modal	Frequency per 100,000 words	Percentage
1	shall	1586.0	70.8	1	shall	1644.3	74.1
2	may	509.8	22.8	2	may	454.5	20.5
3	can	93.3	4.2	3	will	47.4	2.1
4	will	20.0	0.9	4	would	42.5	1.9
5	would	13.3	0.6	5	can	21.2	1.0
6	could	6.7	0.3	6	should	8.7	0.4
6	should	6.7	0.3	7	must	1.3	0.1
7	might	3.3	0.2	0	could	0.0	0.0
0	must	0.0	0.0	0	might	0.0	0.0

deciding which lexical item best fits the frame. The frequency analysis shows that policymakers satisfy empty modal frames by overwhelmingly using “shall” over any of its restrictive alternatives like “should” or “must” and by repeatedly picking “may” instead of other permissive options such as “can” and “might.” Such glaring patterns suggest that policymakers find it most appropriate to frame “restrictive” and “permissive” propositions with “shall” and “may,” respectively.

3.4.2 Modal distribution

The study uses “time” and “fatality rates” to represent the worsening crisis as the issue continues to be increasingly fraught (Torres, Henry, and Ramanathan 2020) and opioid-related fatalities continue to rise in California. The ANOVA and regression analysis, with P values ≤ 0.05 considered statistically meaningful, show that time has a significant positive correlation with the frequency of restrictive modals at $p < 0.05$ and a non-significant correlation with the increase in permissive modals at $p < 0.05$ (Figure 3). Note that each modal would have appeared in a unique policy clause; therefore, the frequency of restrictive or permissive modal is synonymous with the number of restrictive and permissive clauses. The positive correlation is also supported by the gap between the regression coefficients of restrictive ($\beta = .774$) and permissive ($\beta = .159$) clauses, which means

³ Frequency values were calculated using MAXQDA, and Frequencies are relative to every 100,000 words to balance the uneven subcorpus (see Baker 2006). There are a total of 97 original policies and 126 amendments.

restrictive clauses significantly increase five times more than permissive clauses each year.

Similarly, the number of fatal cases has a significant positive correlation with the increase in restrictive modals at $p < 0.05$ and a non-significant correlation with the increase in permissive modals at $p < 0.05$. The results of the outlier test using Mahalanobis distance, with a chi-square (χ^2) cut off of $p < 0.01$, revealed one restrictive and two permissive outliers, all of which were insignificant to the results.

In what follows, I focus on amended policies to examine the changes in modal usage between the original and succeeding versions of the same policy.

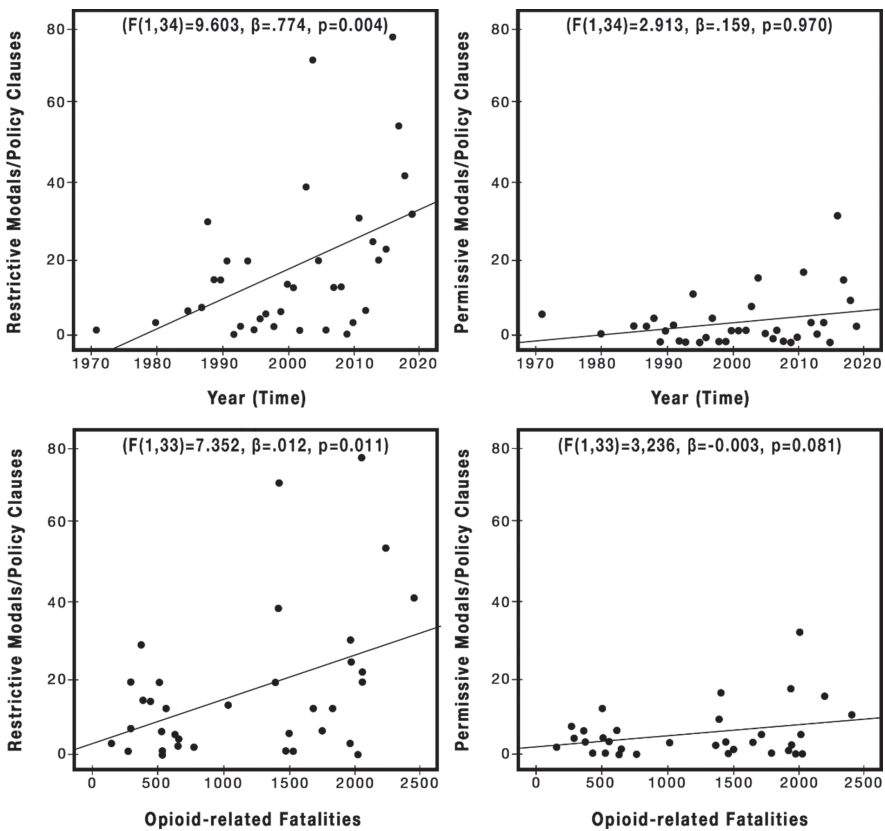


Figure 3: Number of restrictive (left) and permissive (right) modals/clauses across time and fatality rates.

3.4.3 Modal shifts in amendments

Amendments could take the form of adding or deleting provisions as well as reword already existing ones. Thus, these modifications may result in changes in modal frequency. After accounting for all the unique modal changes, amendments can either be a more restrictive or permissive version of the policy. ANOVA and regression analysis revealed a strong association between time and the increase in stricter amendments at $p < 0.05$ ($F(1,20)=14.541$, $p=0.01$) and an insignificant association between time and the increase in permissive amendments at $p < 0.05$ ($F(1,7)=0.370$, $p=.562$). The standardized regression coefficients for more restrictive ($\beta=.649$) and more permissive ($\beta=-0.224$) amendments similarly prove that policymakers added more restrictive clauses, erased more permissive clauses, or amended permissive clauses with restrictive ones.

Even more striking than the quantitative results are the findings from the discourse analysis of amendments. For example, the following excerpt shows a shift from permissive modality in 2002 to restrictive in 2013. The deontic interpretation associated with “may” is permission. Thus, the 2002 policy denotes that the stakeholder, the California Department of Justice, has the discretion over releasing a patient’s controlled substance history to their respective physician. In contrast, the volitional and predictive nature associated with “shall” conveys a stricter message not disguised as permission. Using the permissive “may” to frame the policy gives the policy stakeholder more flexibility, mainly because the action is presented as an option they could elect not to take. Focusing on the only element that differs in the same iteration of a policy allows a balanced assessment of the possible outcomes of choosing one modal over another.

- (1) An amendment showing the change from permissive to restrictive modality⁴

Health and Safety Code 11165.1	
2002 [Phase I]	2013 [Phase III]
The [California] Department of Justice may release to that practitioner the history of controlled substances dispensed to an individual under his or her care . . .	The [California] Department of Justice shall release to that practitioner the history of controlled substances dispensed to an individual under his or her care . . .

⁴ The statute was clipped for brevity. The rest of the content can be retrieved from the internet through California’s legislation website.

Fillmore’s (1975) “frames” and Chilton’s (2004) “modal axis” frameworks taught us that language users fill empty frames using the best-fit exemplar that adequately represents their reality at that particular point in time. Similarly, discourse analysis assumes that deliberate linguistic events – such as going through the trouble of writing, debating, and voting on “amendment resolutions” only to change a single word – cannot be accidental. Rather, the change must be necessary or meaningful enough for the motivations behind the amendment to make sense. When taken all together, discourse analysis and the frameworks that inform it suggest that the increased use of the restrictive “shall” is indicative of a shift in the policymaker’s reality, one that can only be addressed or satisfied if “may” were to be replaced by “shall.”

As discussed earlier, policy researchers – such as Levinson, Sutton, and Winstead (2009) and Hornberger and Johnson (2007) – emphasized that policies are meant to be suggestive, and that enactment is dependent on the interpretation and decisions of the arbiters or stakeholders to whom policies are addressed. The following example provides insight as to how modals could highlight or hide the suggestive intent of policies.

- (2) An example of modal amendment from permissive to restrictive⁵

Health and Safety Code 11165.5	
2003 [Phase I]	2011 [Phase III]
The [California] department of justice may revoke its approval of a security printer for a violation of this division [mishandling/unlawful production of prescription slips]	The [California] department of justice shall revoke its approval of a security printer for a violation of this division [mishandling/unlawful production of prescription slips]

The difference between the two versions in (2) is that the permissive “may” give the state’s justice department more space to negotiate the various interpretations implied by the policy before deciding how they would like to operate. This same space becomes narrower in the 2011 version because “shall” (a) highlights a mandatory rather than suggestive intent, (b) elicits more definitive outcomes, and (c) de-emphasizes or downplays a policy’s suggestive and interpretive property.

⁵ Security printers refer to entities that supply printouts of high-value documents such as identifications and prescription slips.

The following excerpt shows an amendment to the other direction, from a policy that started as prohibitive and later amended to be permissive.

- (3) An amendment showing the change from restrictive to permissive modality⁶

Business and Professions Code 2746.51	
1991 [Phase I]	2001 [Phase I]
Drugs furnished by a certified nurse-midwife shall not include controlled substances . . .	Drugs furnished by a certified nurse-midwife may include controlled substances . . .

Example (3) affirms the role of modality as a reflection of the locality's current state. Policies in the nineties were restrictive of what nurse-midwives can do without an attending physician, including the furnishing of controlled substances, as shown in the example above. With the advancement in workplace training as well as demands to address pain, nurse-midwives were eventually allowed to furnish opioids without supervision, as shown in the 2001 amendment of "shall not" to "may."

The policy went from framing the distribution of opioids as a strongly prohibited action to being at the discretion of nurse-midwives. The modal change grants stakeholders some space to renegotiate whether to enact the policy. Suffice to say, modality can broaden or limit the range of possible actions stakeholders could take.

- (4) An amendment showing a change in modality from slightly permissive to restrictive⁷

Business and Professions Code 3502.1	
1994 [Phase I]	2017 [Phase III]
A physician assistant may not prescribe controlled substances without a physician's order.	A physician assistant shall not prescribe controlled substances without a physician's order.

⁶ Opioids are controlled substances. This statute was shortened for brevity; however, the changes do not affect the analysis. The rest of the content can be retrieved from the internet through California's legislation website.

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“May” can convey a broader range of interpretation than “shall” because the modal ambiguously implies consent, leaving stakeholders with the choice to interpret the proposition as an action they “may” or “may not” accomplish. Example (4) offers a different picture because the 1994 version of the policy specifies the “not” instead of only using “may.” “May not” is more precise in the sense that it defines part of may’s ambiguity. Because the policymakers choose “may not,” they are not providing the overt consent that “may” evokes, signaling that the action’s completion could violate the proposition. While “may” and “may not” have slight differences, they are still more permissive than “shall” and “shall not.” In fact, changing from “may not” to “shall not” in the 2017 amendment suggest that policymakers agree that both differ. The change implies that the restriction “may not” evoked was inadequate at the time. As local policymakers, their knowledge of the severity of the opioid crisis within their constituency makes “shall not” a more fitting choice called for by their immediate environment. The choice of “shall not” is an overt denial of permission that further minimizes what was already a weak semantic expression of possibility evoked by “may not.”

These examples offer tangible evidence that appends a policy perspective to Talmy (1988) and Sweetser’s (1990) understanding of modality as forces that “stops” or “allows.” The analysis in this section opens up the idea of modals as grammatical features that “limit” or “broaden” the interpretive spaces in which policy stakeholders function. Moreover, the specific targeting of modals indicates that policymakers pay attention to modality and see their significance in policy framing relative to the events happening on the ground.

The use of modal verbs indicates the presence of subjects or agents and predicates or actions. The idea that modality denotes restrictions or permissions begs the question of the intended recipients of restrictive policies and the particular actions for which restrictive modality are used. The following section outlines how the sample study answers this question.

3.4.4 Patterns of modal use

Informed by Van Dijk’s (1999) context model framework (see Table 1), this section presents the frequency results from the coding process aimed at answering “who and what are these policies for?” Specifically, the policy stakeholders and actions associated with each restrictive and permissive modal were identified to understand the context in which these policies were written and assess whether patterns emerge from them. Table 6 shows the distribution of restrictive and permissive modals across the three phases of the opioid crisis.

Table 6: Distribution of restrictive and permissive policies across the three phases of opioid crisis.

	Restrictive policies		Permissive policies	
	State employees	Health care provider	State employees	Health care provider
Phase I: <i>p=0.003</i>	35%	65%	56%	43%
Phase II: <i>p=0.049</i>	46%	54%	58%	42%
Phase III: <i>p=0.599</i>	59%	41%	61%	38%

A chi-square test revealed that a significant correlation at $p < 0.05$ exists between the stakeholder and the modal used during Phases 1 and 2. The results denote a higher likelihood for stricter opioid policies directed towards health care providers during the first two phases when opioid was known as the effective painkiller that solved the country's pain crisis. The insignificant distribution of restrictive and permissive policies during the third phase means that restrictive policies no longer targeted health care workers as the distribution is defined by chance. The results also suggest that policymakers initially considered opioid-related issues as concerns bound within hospital walls but later changed their perspectives as state department employees become more active participants in the state's opioid narrative.

Table 7: Policy actions and their percentage share of restrictive policies.

Policy Action	Share of restrictive policies (change from previous phase)				
	Phase I	Phase II		Phase III	
A. Handling pain	11.7%	8.1%	(-3.6 %)	4.2%	(-3.9%)
B. Prescribing guidelines	59%	47.6%	(-11.4%)	42.8%	(-4.8%)
C. Education requirements	18.6%	14.0%	(-4.6%)	12.0%	(-2.0%)
D. Oversight	4.8%	4.4%	(-0.4%)	6.6%	(+2.2%)
E. Diversion programs	5.9%	25.8%	(+19.9%)	34.4%	(+8.6%)

Policies framed using restrictive modals hint at the actions policymakers consider to be priorities at that particular time. The findings in Table 7 show the shifting focus of restrictive policies across the three phases. Policy actions concerning (A) handling pain, (B) opioid prescribing guidelines, and (C) learning about opioids had a higher share during Phase I, when the problem in the state was the lack of pain treatment. The share of the same three policy categories dwindled in the

succeeding phases, as the state's problem transitioned to the worsening opioid crisis, as shown by the percentage change in parenthesis. Meanwhile, the shares of restrictive policies tackling (D) oversight and (E) diversion showed growth from Phase I to Phase III – when opioid prescription rates and overdoses skyrocketed – validating the claim that the circumstances in which restrictive modality is employed mirror the needs of the community. In this case, actions framed with restrictive modality index high importance.

Of course, the sample study is not without its limitations, including relying on proxies such as time and fatality rates to quantify the worsening crisis. Moreover, the restrictive and permissive framework is not intended to be a definitive categorization of the core roles modal auxiliaries serve in policies, as the corpus is limited to a particular locality, and discourse analysis, while based on overt palpable evidence, is intended to be inferential (Wodak 2004).

3.5 Conclusion of the sample study

The findings suggest two potential functions of modals in policies: (i) to mirror or call attention to the gravity of the issues happening on the ground, and (ii) reconfigure the interpretive spaces in which stakeholders operate. The frequency analysis of the corpus revealed “shall” and “may” as the most occurring modal verbs, suggesting a restrictive-permissive distinction existing in California opioid policies. The quantitative findings further proved that the growing use of restrictive modality has a positive correlation to the worsening crisis. Meanwhile, a close analysis of the amendments in which only modals were changed suggest that policymakers choose between restrictive and permissive modality based on the option they believe best satisfies the pressing concerns of the time. In other words, having permissive and restrictive modals be in complementary distribution is indicative that modal choices carry a particular significance to policymakers. Moreover, having either permissive or restrictive occupy the same frame means the two serve the same discourse functions; that is, both reflect the gravity of local realities and both shape policy interpretation, albeit in different directions. As Thompson (2001: 151) points out, paying attention to modal usage “reveals something of the choices that are available” in expressing meanings and “something of the way written discourse is constructed.”

The enactment of policies is the culmination of a complex process that includes parsing modals alongside other grammatical features in the policy. I refer to these agentive spaces, where stakeholders negotiate the meanings they make out of the collective semantic prosody evoked by policies, as “interpretive spaces.” An alternative term could have been “implementational spaces,” used

by Hornberger and Johnson (2007). However, the concept of interpretive spaces accounts for the meaning-making process more than it addresses how actions are accomplished. In this sense, implementational space is the holistic processing of policies, while interpretive is the precursor, if not an aggregate, of a more comprehensive implementational space. In other words, interpretive spaces are concerned with “how policies are understood” while implementational spaces refer to “how one’s interpretation is put into action.” Paying attention to modality has significant implications for policy implementation. If policymakers adapt the proper modal to align with their desired outcomes, then they can attenuate the extent to which interpretive spaces unfold, which, in turn, influences the implementational spaces where stakeholders enact policies.

Nonetheless, the approach employed in this study saves policymakers and researchers valuable time examining the policies of pertinent local issues. The mining of modals from a complete and well-defined corpus can: (i) provide researchers and policymakers an overview of the general tone of policies, as either restrictive or permissive, (ii) reveal the entities to whom most restrictive and permissive policies are addressed, and (iii) identify the actions policymakers have implemented thus far. These can inform future amendments and policy planning when addressing certain local concerns.

4 Chapter conclusion

This chapter provides a cogent applied linguistic framework for extending LPP research to include scholarship analyzing the language of policies through corpus-based discourse analysis. The sample study shows that the synergy between quantitative and qualitative approaches results in a robust examination of policy discourse, an approach that can be extended further to data of various types and sizes. Finally, this chapter proves that corpus-based discourse analysis carries heuristic value for applied linguists and other researchers who recognize the weight of language choices within societies.

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