The Nation's Fix: The Language of the Opioid Crisis

By

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Abstract

This dissertation draws on various discourse analysis approaches to uncover the grammatical, discursive, and prosodic linguistic features shaping the opioid crisis in order to understand how language provides a window into chronic pain management issues. Specifically, this dissertation is comprised of three interrelated investigations examining the language used by California policymakers in addressing the crisis and by physicians and patients at West Coast Medical Center (a pseudonym) to enact, negotiate, and reinterpret such policies.

Part I focuses on policymakers' use of modality as a grammatical feature that calls attention to the gravity of local issues and reconfigures the interpretive spaces in which policy stakeholders could act. Part II reveals physicians' use of face-saving discourse features when enacting restrictive opioid policies, demonstrating the communicative burden placed upon physicians by policy demands. Lastly, Part III focuses on patients' use of prosodic features (i.e., low pitch and creaky voice) in describing their chronic pain symptoms and requesting opioids.

This dissertation demonstrates how the mining of modals could help streamline policy analysis on any pertinent issue and how the study of discourse could help identify opportunities for medical institutions to support their physicians and for physicians to support their patients.

This dissertation offers a top-down policy analysis and a bottom-up interaction analysis perspective on how communities linguistically address the opioid crisis, contributing to an applied sociolinguistic understanding of health policies and their discursive manifestations on the ground. This dissertation is also methodologically and theoretically informed by various linguistic domains and approaches, including language policy and planning, sociopragmatics, sociophonetics (prosody), and corpus linguistics. Such an interdisciplinary undertaking allows

for a broader understanding of the discourses surrounding opioids and chronic pain while remaining sensitive to the subtlest—yet socially significant—linguistic features that could help us make sense of the linguistic choices made during medical crises.

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1 Introduction

1.1 Overview

Saige, a 23-year-old mother, was first introduced to prescription painkillers when she had her wisdom teeth removed, an event that set her on a downward spiral that led to heroin addiction. She fatally overdosed after deciding to take one last shot of heroin before entering a drug treatment center in California, falling victim to what is presently a dominant cultural issue: the opioid crisis; see Seelye (2018) for full article. In fact, drug overdoses are the leading cause of death for Americans under 50 (National Center for Health Statistics, 2017), and conversations around this topic are fraught with tension. Sufferers of chronic pain who rely on opioids to maintain a reasonable quality of life find themselves subjected to the stigma associated with opioids. The complexities around this issue put doctors and medical personnel on guard, giving rise to what Hoffman and Tarzian (2003) call the "chilling effect," in which medical professionals refrain from prescribing pain medication due to fear of being penalized. The consequences of this effect are partially reflected in the views of the members of "Don't Punish Pain," an online community whose sentiment is best summarized by their tagline: "You are only one accident away from walking in our shoes."

Chronic pain is a condition in which the nervous system continuously activates the pain sensors, and opioids are narcotics with pain-relieving or analgesic effects typically prescribed to manage the condition. Opioids can stimulate euphoria, and prolonged usage can result in chemical dependency (Henry et al., 2019b; Sehgal et al., 2012; Tseregounis et al., 2021). Since the United States Centers for Disease Control and Prevention (CDC) declared opioid abuse a national "epidemic" in 2011, opioids ("the nation's fix") have been a fixture in everyday

conversations within legislative and medical spaces. Though the U.S. Federal Government and various state governments have launched aggressive campaigns to battle the crisis, the number of opioid-related fatalities continues to rise. According to the CDC and the U.S. Department of Health and Human Services (HHS), three out of four heroin users were first exposed to narcotics through prescription opioids; their report also shows that the number of opioid-induced fatalities quadrupled between 1999 and 2014 and that an average of 130 daily cases were recorded between 2014 and 2017. Rubbing salt into this already painful wound, their most recent records show that 58.5 opioid prescriptions were written for every 100 patients in 2017 alone.

It is within the details of this sociocultural and public health issue that the current dissertation broadly locates itself. Situated in applied sociolinguistics and informed by language policy and planning, pragmatics, corpus linguistics, and phonetics, this dissertation uses both qualitative and quantitative approaches to examine the discourses surrounding chronic pain and the opioid crisis in the two most prominent settings in which the epidemic is addressed: policies and medical interactions. The two broad objectives of this research are (1) to identify the salient linguistic features—whether they are grammatical, discursive, or prosodic—through policy analysis of written legislation as well as interaction analysis of physician-patient exchanges, and (2) to probe how these features provide a window into pain management issues and the opioid crisis.

Drawing on multimodal corpora—compilations of various forms of data including written and spoken ethnographic materials (O'Halloran, 2011)—this investigation examines the

language policymakers and stakeholders (physicians and patients)[1] use in framing and enacting opioid policies, respectively. The multimodal corpora consist of a written corpus of California opioid policies and a spoken corpus of audio recordings gathered from one of the state's medical institutions, which is referred to here by the pseudonym West Coast Medical Center (WCMC). California was chosen for this dissertation because of the increasing number of opioid-induced fatalities in the state. Similarly, WCMC is an ideal setting for this dissertation because it endeavors to address the opioid crisis through interdisciplinary research on policy, pain, and opioids. According to McCarty (2014), the use of multimodal corpora, especially if informed by ethnography, allows for a broader understanding of how policies are framed at the top level and how they are accommodated, adapted, resisted, and transformed within interactions taking place at the local level. The following section explains how this distinction between top and local levels informs the structure of this dissertation.

1.2 Top-down and bottom-up perspectives

This dissertation is structured according to the two perspectives through which policies are implemented and experienced: (1) the macro-level perspective (or "top-down" approach), which views policies as mandates developed by a governing body whose hierarchical position or distinction serves as leverage enhancing the compliance of targeted stakeholders or groups (Sabatier and Mazmanian, 1980); (2) the micro-level perspective (or "bottom-up" approach*)* focuses on local stakeholders meeting pressing needs by either implementing or distorting

[1] Note that this entire study refers to individuals who enact or are addressed by policies with the more gender-neutral descriptor "policy stakeholders" in place of the familiar "policy actors."

mandates (Lipsky, 1971). In view of these synonymous conceptions, "top-down/bottom-up perspective" and "macro-micro perspective" will be used interchangeably in this dissertation as the encompassing term describing the overall framework.

In the context of this dissertation, analyzing California's policies provides a window into how policymakers use language to address the opioid crisis from a top-down perspective, while examining spoken interactions uncovers the language that emerges when local stakeholders interpret and enact opioid policies from the bottom up. On a deeper level, the top-down analysis of the language used by those whom the community selected to hold power reveals the hidden societal ideologies and attitudes that the community desires or tolerates (Gales, 2009; see also Stubbs, 2001). In other words, top-down analysis is crucial in understanding policies because it allows us to uncover the community's stance on issues and the extent to which it desires to address them. Similarly, understanding how policies are interpreted and enacted from the bottom up allows local stakeholders, for whom policies are imposed, to challenge the dominant ideologies and biases emerging from top-down policies created for them by someone else (Canagarajah, 2005, p. xix).

The backbone of this investigation is the notion that policies are realized in everyday life, a point that Fairclough eloquently makes in his writing:

> To research meaning-making, one needs to look at interpretations of texts as well as texts themselves, and more generally at how texts practically figure in particular areas of social life, which suggests that textual analysis is best framed within ethnography. To assess the causal and ideological effects of texts, one would need to frame textual analysis within, for example, organizational analysis, and link the 'micro' analysis of texts to the 'macro' analysis of practices and structures. (2003, p. 15-16)

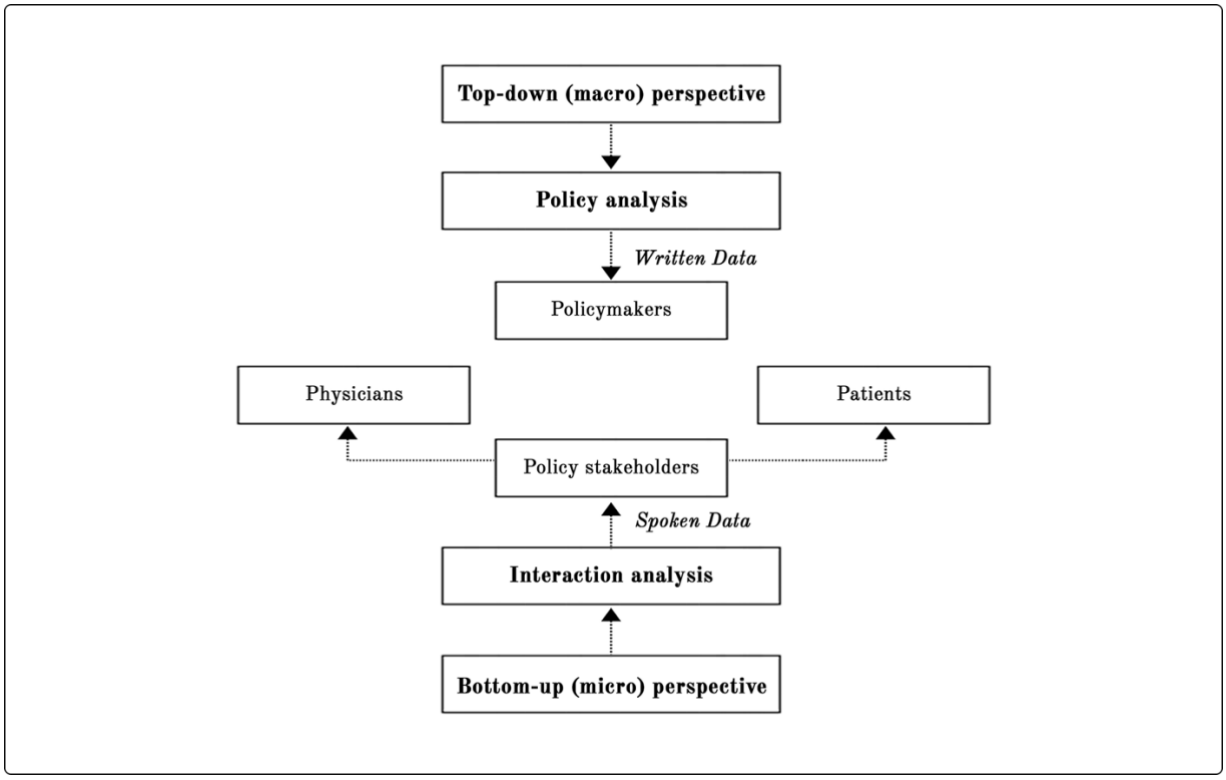
Fairclough's point reinforces this dissertation's holistic analysis of the synergies between top-down policies and bottom-up enactments. Following Fairclough, Ramanathan (2005) and

Canagarajah (2005) advocate for incorporating a bottom-up perspective in policy analysis, citing its potential for developing and transforming top-down policy planning. In order to ensure that both perspectives are represented, this dissertation is divided into three interrelated studies—one on top-down policies and two on bottom-up interactions. The following section provides more information on each of the three studies and how they relate to each other.

1.3 Three core dissertation components

This dissertation demonstrates how language permeates everyday discussions surrounding the opioid crisis. For instance, language serves as a means for policymakers to shape policies, physicians to discuss treatment, and patients to express pain. On top of that, the language used by policymakers in drafting policies influences how stakeholders interpret and construct meanings around such mandates. The language physicians use in enacting policies—especially policies restricting opioid prescriptions—could impact the collaborative relationships they have fostered with their patients. Lastly, the language patients use when describing their suffering in consultations could influence the physicians' treatment decisions, especially since chronic pain symptoms are neither easily visible nor objectively measurable (Heath, 2002; Sullivan & Ferrell, 2005; Henry & Eggly, 2013). Thus, the three core components of this dissertation focus on the language used by (1) policymakers, (2) physicians, and (3) patients as they participate in the opioid crisis narrative. Figure 1.1 illustrates the relationship between the three core studies forming this dissertation and the overarching macro-micro model informing it.

Figure 1.1: Three core studies according to top-down and bottom-up perspectives



Note: Diagram showing the three main components of this dissertation and their relations to top-down and bottom-up perspectives of policy research.

A preliminary investigation was necessary to narrow down the specific linguistic features that warrant further examination in each study. The following section provides an overview of the three studies and the rationale for picking the investigated features in each.

1.3.1 Study descriptions and justifications

In outlining the three core studies in this dissertation, I also map the trajectories that shaped them, from the preliminary research questions to how key language issues concerning opioids and existing literature gaps informed the final research questions. Aside from setting up the structure of this dissertation, my goal for stating the preliminary questions is to demonstrate the extent to which the methodologies used here could be replicated in future studies, especially

in addressing similar broad questions involving healthcare[2] policies. Lastly, I preview how each of the three studies are either methodologically or theoretically informed by various linguistic domains and approaches, including language policy and planning, sociopragmatics, sociophonetics (prosody), and corpus linguistics. Before reading this entire dissertation, most researchers in the field may consider all the moving parts in this project to be separate, unconnected entities—an understandable take considering the scope covered expands past a couple of linguistic fields; after reading this section and the rest of the dissertation, my goal is for the readers to see just how transparent the synergy between these various areas could be and how such an interdisciplinary approach could broaden our understanding of the discourses and linguistic choices surrounding the opioid crisis.

Part I: Policymakers. This study focuses on the language use of policymakers in framing top-down California opioid policies. Given that this study is the only analysis in this dissertation carried out on written data, it made the most sense to focus on a grammatical feature for a robust representation of macro-micro perspectives. The initial questions—*How do policymakers use language within policies to address the opioid crisis?* and *What roles do certain grammatical features play in the framing of policies?*—emerged from the notion that the language policymakers use in drafting policies can influence how stakeholders interpret and construct meanings around them. Modality (i.e., verbs like *can*, *will*, *shall*) was the key grammatical feature pursued in this chapter because it emerged as the most consistent component of policy

[2] This dissertation uses the term *health care* to refer to practitioners and providers who deliver care, consistent with the use of the term in California policies. *Healthcare* is used for all other circumstances, as a noun referring to the industry or adjective modifying nouns other than providers (e.g., healthcare policy).

verb phrases during a preliminary analysis. The choice was also strengthened by policymakers' excessive use of modal verbs, even though their potential for ambiguity has been well-established for decades (see Lyons, 1977). It is also surprising that modality's role in shaping legislation has remained largely unexamined, while policies, as described by Fairclough (2003), are among the most prominent and consequential outlets by which social and health issues are discussed.

This study uses corpus-based discourse analysis (described further in Section 3.3.2) to uncover the role modals play in policies and the motivations behind choosing potentially ambiguous auxiliaries over straightforward verb phrases in discussing highly consequential issues such as the opioid crisis. In Part I, I argue that modals serve two potential functions in policies: (1) to mirror or call attention to the gravity of local issues and (2) to reconfigure the interpretive spaces in which policy stakeholders can act. This chapter also shows that focusing on modals and their surrounding verb phrases allows researchers to streamline the analysis of any policy issue.

Part I is informed methodologically by corpus linguistics—an empirical approach interested in systematically uncovering patterns of language use from a collection of text, leading to results that allow for a greater degree of generalizability and validity (Biber et al., 2012).

Part II: Physicians. Part II builds on the increasingly restrictive opioid policies identified in Part I, focusing on how such restrictions are linguistically manifested through the discursive strategies of physicians during chronic pain consultations. This exploration began with the initial question: *What salient features describe the physicians' enactment of opioid policies?* On one hand, the epidemic has prompted numerous interdisciplinary investigations meant to curb

inappropriate opioid prescribing; most of such investigations cite collaborative partnerships as one of the best practices (Fishman, 2016; Henry et al., 2016; Hood-Medland et al., 2021). In contrast, stricter policies and the stigma attached to opioids have led to chronic pain discussions being fraught with distrust (Merrill et al., 2002). Thus, it seems counterintuitive to aim for collaboration now that stricter policies could make consultations more contentious. This dilemma inspired the decision to focus on the discourse strategies of physicians as they attempt to walk such fine lines. As the analysis took shape, it became more apparent that the study should focus on face, which emerged as the central theme describing all physicians' handlings of policy demands. With the crisis remaining prevalent to this day, very little is known about physicians' discourse strategies in the context of chronic pain and opioids, so this investigation has the potential to inform future health policy implementation and medical practice.

Using data-driven discourse analysis (explained further in Section 4.3.2), this study uncovers the face-saving strategies (Brown & Levinson [1978]1987) used by WCMC physicians as they abide by restrictive opioid policies during medical consultations. By showing that top-down opioid policies increase the communicative burden placed upon physicians in this study, I make a case for the importance of health institutions providing physicians with some guidance on how to communicate policies.

With face being a multidimensional concept, Part II is grounded at the intersection of sociopragmatics—the study of meaning expressed through language and its relationship to context (Sifianou & Tzanne, 2021)—and interactional sociolinguistics—the bridging of communicative forms of language such as word choices and prosody to create and interpret meaning (Gumperz, 2005).

Part III: Patients. This study aims to describe how patients engaged in challenging and fraught discussion of opioids with their physicians, knowing very well that their complaints and requests could be interpreted as drug-seeking behavior, regardless of intention (Højsted & Sjøgren, 2007). This led to the initial question: *What salient linguistic features emerged from patients' discussion of pain and opioids?* As discussed earlier, chronic pain is not like a bruise or a cut that you can simply show the physician to prove the existence of pain. The reality that patients must rely on talking to express their suffering (Heath, 2002) motivated this study's focus on the prosodic features by which WCMC patients communicate pain, from the shifting of pitch to the use of creaky voice.

Using prosodic or phonetic discourse analysis (Chafe, 1993; Du Bois et al., 1993; detailed in Section 5.4.1), I show that patients consistently shifted their pitches toward their lower registers; most times, that shift was concurrent with the use of creaky voice to narrate chronic pain symptoms, express pain, and request opioids. I argue that the patients' consistent use of certain voice features in very specific contexts call attention to the importance of what they are saying. In this case, patients speak differently from how they would usually speak when discussing the fraught topic of opioids. I also point out that training physicians to recognize sudden register shifts could alert them to issues patients may have about the topic, and how its value is marked enough to warrant a drastic differentiation of their voice. Similar to Part II, Part III emphasizes the difficulty of addressing chronic pain, the subjective nature of pain itself, and how the language policymakers use in policies influences the exchanges happening on the ground. This information is especially valuable for policymakers who write policies that are not informed by the input, opinions, and stances of the stakeholders to whom their policies are addressed.

Part III is informed by sociophonetics—a framework for the acoustic investigation of sound, prosody, and social meaning (Zimman, 2020)—and interactional linguistics.

The next section provides the central question addressed in this dissertation and the specific questions tackled in each of the three studies.

1.4 Research questions

Though each of the three core components of this dissertation addresses its own specific research question, they are all connected, collectively forming the central question addressed in this dissertation:

> *What salient linguistic features emerge from policymakers' grammatical framings of opioid policies, physicians' verbal implementations of policy, and patients' articulation of pain and suffering, and how do these three, individually and collectively, provide a window into issues of pain management and the seriousness of the opioid crisis?*

Table 1.1 provides the specific research questions addressed by the three studies in this dissertation.

Table 1.1: Specific research questions for this dissertation

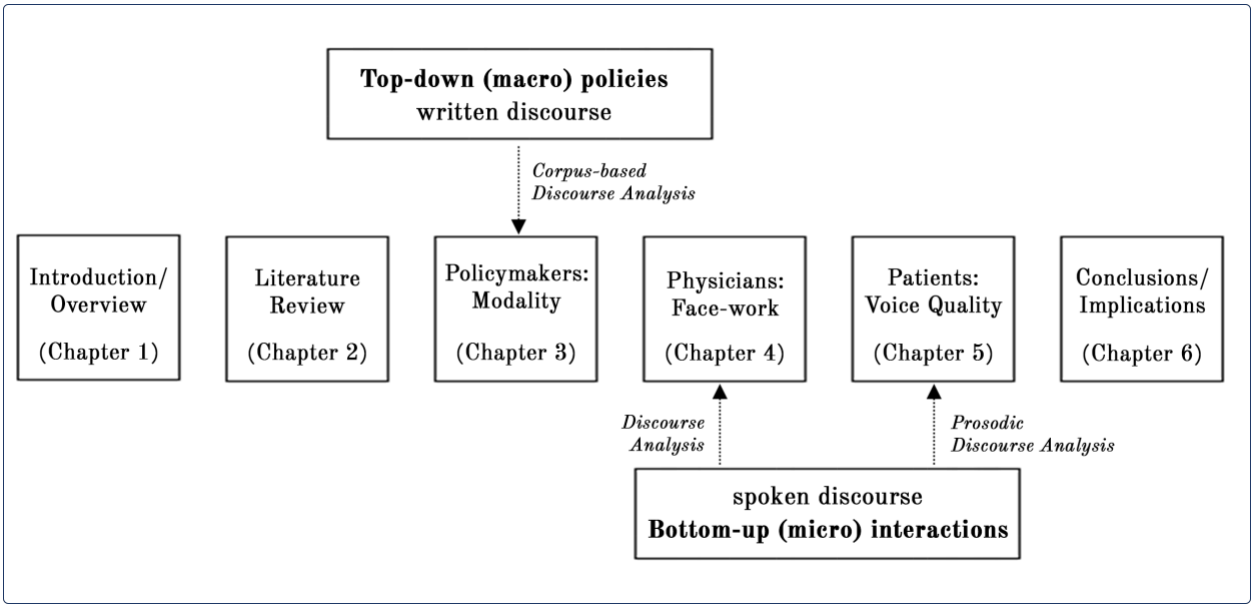
	Research questions	Investigated linguistic feature (Type)
Part I: Policymakers	What roles do modals play in the framing of opioid policies?	Modal verbs (Grammatical)
Part II: Physicians	What face-saving discourse features emerge from physicians' enactment of opioid policies?	Face-work (Discursive)
Part III: Patients	What context-specific voice qualities or prosodic choices were used by chronic pain patients to express pain and request opioids?	Voice quality (Prosodic)

Identifying the salient linguistic features—grammatical, discursive, and prosodic—that emerged from opioid policies and medical interactions allows for an understanding of how language, in its various forms, provides a window into pain management issues and the opioid crisis.

1.5 Structure of this dissertation

This dissertation consists of six chapters and is structured as follows. This introductory chapter has introduced the opioid crisis and the three core components of this dissertation. Chapter 2 reviews key literature and defines relevant concepts that help situate this dissertation within language policy and planning (specifically) and applied sociolinguistics (broadly); the chapter also provides an overview of discourse analysis, the primary analytic approach used in this dissertation, as well as an overview of the opioid crisis in California, the backdrop against which the discourses will be examined. Chapter 3 (or Part I) presents the analysis of California opioid policies, focusing on the salient grammatical features emerging from the language of policymakers. Chapter 4 (or Part II) dissects the audio recordings of doctor-patient consultations collected at WCMC to uncover the primary discursive features characterizing how physicians implement opioid policies. Chapter 5 (or Part III) takes on a different set of recorded WCMC consultations to point out the salient prosodic features describing patients' speech. Chapter 6 ties each aspect of this dissertation back to the top-down/bottom-up policy framework, highlighting the practical and methodological implications of my findings as well as limitations so as to inform future investigations. Figure 1.2 maps out the structure of this dissertation.

Figure 1.2: Diagram mapping or outlining the structure of this dissertation



Note: This outline shows the progression of this dissertation and how each component relates to top-down and bottom-up policy perspectives, as well as the methodologies involved and discourse features under investigation.

2 Related Literature

This chapter aims to provide an in-depth account of key literature relevant to this dissertation. For the sake of organization and ease of reading, I reserve the discussion of key literature pertinent to specific chapters until those chapters' literature review segments. This review is divided into four sections. Section 2.1 provides an overview of policies in the context of linguistics. Section 2.2 situates this dissertation within the domain of language policy and planning by presenting how the field has expanded from inquiries specifically covering language policies (policies about language) to what now includes investigations on the very language forming the policies and their linguistic local enactments. Section 2.3 bridges the first two sections to the reality of the opioid crisis today by outlining the development of California's opioid policies. Finally, Section 2.4 briefly diverges from policies to discuss the various discourse analytic approaches utilized in this dissertation.

2.1 Defining policies

The interdisciplinary nature of policy analysis has resulted in varying definitions of the word. From a political science perspective, Birkland (2015) defines policy as any form of communication from any level of government that declares what the government intends to do to address public concerns. Meanwhile, Ball (1990) and Goodnow (2017) define policies as authoritative texts and de facto practices used by governing institutions to reflect social knowledge in the plans, procedures, and goals that guide local decision-making. Most linguistic research on policies have subscribed to broad definitions set by scholars from other domains; this makes sense because their analysis does not call for a language-centered definition. However, since this dissertation intends to dissect and characterize the discourse features that make up

policies or their enactments, a linguistically viable definition of policy is necessary. Thus, drawing on the linguistic aspects of the definitions above, this dissertation defines policies as:

> *Chunks of spoken or written language made up of lexical and grammatical features denoting suggestive intent of regulatory measures and courses of action concerning a given issue.*

Policies can either be *de jure*—overt written policies legitimized through a process established within the organization—or *de facto*—unwritten practices that assist organizations to function and are usually passed along through tradition (see also Johnson, 2013, p. 10 for detailed distinction). According to Fairclough (2003, p. 91), what sets policies apart from other genres like news reports is the likelihood that they include causal clauses—phrases introduced by expressions like *to, in order to,* and *so as to,* among others—which are indicative of purpose relations. Since *likelihood* merely suggests a possibility, I could not necessarily disagree with this take per se. On one hand, this dissertation shows that purpose is rarely explicit in state policies. On the other hand, this project agrees that policies always have a purpose, albeit implicit. Hence, this dissertation offers an elaboration of what policies are, ranging from being seen as a genre expected to be direct and upfront to one in which purpose may be implicit and meanings arbitrary, relying on how language users interpret and create meanings out of them.

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, discourse and policy scholars must consider these distinctions when deciding which policies to investigate in trying to find connections between the language of policies and local enactments.

The primary federal units responsible for public health issues in the United States are the Department of Health and Human Services (HHS), the Centers for Disease Control and Prevention (CDC), and the Food and Drug Administration (FDA). 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, as it is not involved in the local realization of the funds. Instead, federal institutions can only draft contracts that obligate states to take action toward 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 next section of the literature review elucidates why the analysis of policies in Chapter 3 is situated within language policy and planning (LPP) research. First, I define policies in linguistic terms. Second, I show that the question of how policies affect language use in local linguistic communities resides at the core of LPP research. Lastly, I explain how recent shift and innovations within the field have broadened its scope to now include investigations on the language of public policies and its impact to local practices.

2.2 Language policy and planning

Language policies, in broad terms, refer to guidelines regulating language use in communities (Fishman et al., 1968). The first wave of scholarship in the 1960s focused primarily on the codification of national languages since, at the time, standardization was regarded as a solution for establishing a unified sense of identity among coexisting communities (Haugen,

1959, 1983; Fishman et al., 1968). Although not necessarily ill-intentioned, these policies represent top-down solutions that ultimately limit how people think, communicate, and identify themselves (Noss, 1967; Das Gupta, 1970). The solution proposed by applied sociolinguists was to incorporate a bottom-up approach to top-down policymaking so that both policymakers and policy arbiters are actively engaged in what should be a cyclical process (Menken & Garcia, 2010).

The idea of 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 toward focusing on micro-level interactions taking place on the ground, using ethnography and discourse analytic techniques to investigate local policy enactments in areas such as schools and workplaces, with researchers beginning to confront the interpretive nature of policies (Pérez & Nordlander, 2004; Levinson, Sutton, & Winstead, 2009; Hornberger & Johnson, 2007; Tollefson, 1991, 2002, 2006; Johnson, 2013). According to Johnson and Freeman (2010), policies can be interpreted and understood in different ways by stakeholders who "appropriate, resist, or change dominant and alternative policy discourses" (p. 15). Further, Shohamy (2006) points out the importance of knowing how such policies are being implemented locally, because language can be manipulated to perpetuate various ideologies. For instance, Ricento and Hornberger (1996) investigated the role English instructors play as language policy "arbiters" or "stakeholders" in the classroom, revealing discrepancies in the interpretation and enactment of policies. Similarly, Johnson (2012) examined the stakeholders' diverging interpretations of Arizona's language education policy—known as Proposition 203—to illustrate how interpretation influences stakeholder response, while Wiley and Wright (2004) studied federal

education policies to expose the marginalization of indigenous and minority languages in academic institutions. 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 & Garcia, 2010). This dissertation uses the term *interpretive spaces* to refer to such spaces where the meanings of written discourses such as policies are negotiated.

As Hornberger (1998) explained, ignoring the effect of policies discounts the agency of the very people in charge of linguistically interpreting them. Hult (2010) further explains that the incorporation of ethnographic methods and discourse analysis has allowed LPP researchers to accomplish the complicated feat of bridging macro-level (policy texts) with micro-level (local interactions) applied sociolinguistic inquiries in LPP, elucidating the connection between policies and their interpretations. Top-down/bottom-up LPP research was eventually used to promote language rights (Kymlicka & Patten, 2003; Ramanathan, 2013; Ricento, 2000), indigenous languages (McCarty, 1993; Patrick, 2012), literacy (García & Flores, 2012; Gee, 2000; Tollefson, 2002) as well as multilingualism (Feuerherm, 2013; Maryns, 2012; Omoniyi, 2012). As Davis (1999) explained, the field has done more than simply establish national languages.

One particular development in the area is the growing presence of scholarship examining the language of healthcare policies in language policy publications (Schuster, 2007). In a paper about bilingual education language policies, Stritikus and Wiese (2006) highlighted health policy interpretation and enactments as a possible direction for future studies. Moreover, in a special issue of *Language Policy*, Ramanathan (2010, p. 2) advocates for the importance of addressing *language* and *policy* concerns separately rather than 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 with 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. Similarly, Davis and Pope (2010) analyzed the policies (or lack thereof) concerning person-centered communication between caregivers and Alzheimer's patients, while O'Malley (2010) examined how maternity care policies are articulated in face-to-face interactions at an antenatal clinic. Finally, scholars like Ainsworth-Vaughn (1998), Ramanathan (2009), and Sarangi and Roberts (2008) have sought to address critical and cultural issues around policies concerning ailments.

This newer wave of language policy research—one that pays attention to the language of policies—allows us to understand the state of the community that implements it (Wodak, 2006; Ramanathan & Morgan, 2007). After all, the existence of such policies relies on the needs calling for them.

2.3 Overview of the opioid crisis

This section maps out the landmark policies enacted at both the federal (United States) and state (California) levels to illustrate the significant shifts in the history of and sentiments toward prescription opioids. Ultimately, the events that led to the current opioid crisis are best explained through a timeline with three different phases: pain epidemic, transition, and opioid

epidemic. These distinctions will be used as the backdrop against which the policy analysis in Chapter 3 is conducted.

2.3.1 Phase I: Pain epidemic (1970 to 2003)

In the 1970s, before the opioid crisis, the United States dealt with an entirely different problem—the lack of pain treatment. The solution proposed by policymakers across the country was to change the way medical practice addressed pain, shifting from finding its source to instead directly targeting pain itself (Caudill-Slosberg et al., 2004). Thus, policies that went into effect between 1970 to 2003 were more concerned with alleviating patient pain than they were with overprescribing opioids, as can be seen in the following timeline:

1986: The World Health Organization (1986) released its 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 Business and Professions Code section 2241.5, more popularly known as 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 Health and Safety Code section 124960 or 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 along with temperature, blood pressure, pulse rate, and respiration rate.

2000 The California Board of Registered Nursing (2000) required pain to be 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 with taking action if the patient's pain is beyond their comfort level.

2.3.2 Phase II Transition (2003 to 2010)

Based on the statistics presented by the CDC and the HHS, the U.S. opioid prescription rates increased substantially starting during Phase II, averaging 81.2 prescriptions for every 100 Americans. The policies that were "chaptered" or approved by state legislators in this time were a mixed bag. On one hand, policies started addressing issues of addiction, albeit on a small scale. On the other, policies intended to make prescription opioids more accessible for treating any kind of pain continued to emerge.

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 (as shown in Table 2.1). The insertion of "dangerous drugs" and the coordinating conjunction "or" right beside "controlled substance" twice in the policy implies some degree of equivalency. The verb "dispense" was also added to the list of tasks physicians could perform, therefore widening the scope of possibilities for patients to receive opioids. Adding a verb is suggestive that what was already written—"prescribe and administer"—was not enough.

Table 2.1: 2006 amendment of the 1990 California Intractable Pain Act

1990	2006
"A physician may prescribe or administer controlled substances for intractable pain."	"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 or administering controlled substances."	"No physician shall be subject to disciplinary action for prescribing, **dispensing,** or administering **dangerous drugs or** controlled substances."

Note Characters in bold represent added segments. Statute was clipped for brevity. The rest of the content can be retrieved from the internet through California's legislation website.

2.3.3 Phase III Opioid Epidemic (2011 to Present)

Ultimately, Phase III marks the beginning of a more deliberate and aggressive campaign against opioid addiction. The policies chaptered during this phase 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 (see Table 2.2).

2014: The Medical Board of California released an extensive guideline for prescribing controlled substances for pain. The guideline required patients to sign a Pain Management Agreement (also referred to as the Patient-Physician Agreement) outlining various joint responsibilities of the physician and the patient. The agreement includes committing to (1) periodic drug testing (blood, urine, hair, or saliva) to ensure that medication is being taken as indicated and (2) discussing an "exit strategy" or an alternative non-opiate treatment plan in the event that tapering or discontinuing opioid therapy becomes necessary (see Brown Jr. et al., 2014, the suggested citation for the guideline).

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.

2016: The California Senate Bill 482 required any health care provider 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.

2018: The California Assembly Bill 2256 required physicians to co-prescribe the anti-overdose medication naloxone (also known by the brand name Narcan) with opioids.

Table 2.2: The 2013 amendment of the 1996 California policy defining CURES

1996	2013
"To assist law enforcement and regulatory agencies in controlling the diversion and abuse of Schedule II controlled substances."	"To assist **health care practitioners in their efforts to ensure appropriate prescribing, ordering, administering, furnishing, and dispensing of controlled substances**, law enforcement and regulatory agencies in controlling the diversion and abuse of Schedule II, **Schedule III, and Schedule IV** controlled substances."

Note: Taken from Health and Safety Code 11165 in which CURES is defined. Characters in bold represent the changes.

This timeline illustrates where sentiments concerning opioids lie at specific points in California's history. The evolution of opioid policies depicts how opiates were once viewed as the answer to the harrowing pain crisis, only to later become the problem that needs solving.

To add more context to just how devastating the opioid epidemic has become, the increase in opioid-induced fatalities in California between 1968 until 2019 is shown in Table 2.3.

Table 2.3: Number of opioid-related fatalities in California from 1968-2019

Year	Fatalities	Crude rate	Year	Fatalities	Crude rate	Year	Fatalities	Crude rate
1968	113	0.6	1985	519	2	2002	1453	4.2
1969	166	0.8	1986	520	1.9	2003	1398	4
1970	280	1.4	1987	290	1	2004	1413	4
1971	273	1.3	1988	365	1.3	2005	1372	3.8
1972	376	1.8	1989	432	1.5	2006	1511	4.2
1973	428	2.1	1990	375	1.3	2007	1657	4.6
1974	529	2.5	1991	288	0.9	2008	1801	4.9
1975	629	2.9	1992	523	1.7	2009	1987	5.4
1976	506	2.3	1993	640	2	2010	1929	5.2
1977	161	0.7	1994	501	1.6	2011	1939	5.1
1978	123	0.5	1995	528	1.7	2012	1719	4.5
1979	153	0.7	1996	651	2	2013	1948	5.1
1980	145	0.6	1997	617	1.9	2014	2024	5.2
1981	215	0.9	1998	768	2.3	2015	2018	5.2
1982	314	1.3	1999	1474	4.4	2016	2012	5.1
1983	279	1.1	2000	1012	3	2017	2199	5.6
1984	343	1.3	2001	551	1.6	2018	2410	6.1
						2019	3364	8.5

Note: 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.[3]

In the next section, I provide an overview of discourse analysis, the approach most utilized by researchers investigating the language of health policies and their local enactments, including the research of Davis and Pope (2010), Higgins (2010), O'Malley (2010), and

[3] 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.

Martinez (2008) reviewed in Section 2.2.

2.4 Discourse analysis

While this dissertation combines qualitative and quantitative approaches to the study of written and spoken discourses, the primary analytic approach employed here is discourse analysis. The approach is suitable for the goal of this entire project to identify and interpret the linguistic features characterizing written policies and spoken interactions. Discourse analysis is interested in deconstructing and explaining various forms of discourse beyond the syntactic level—from the motivations eliciting certain linguistic choices to the communicative means through which discursive agendas are met (see Van Dijk, 1985; Johnstone, 2018). I find it most helpful to describe discourse analysis through the following primary questions: *Why this? Why now? So what?* Within these questions are a host of others intended to clarify and further contextualize such as: *Why does this feature stand out? Why this instead of any other alternative? What does this accomplish? What else about the language user could motivate this?*

The science of discourse analysis is anchored on its ability to test hypotheses about language use in a systematic, replicable, and meticulous way—from the consistent treatment of variables to the use of an appropriate, sound, and grounded framework. Discourse analysis is interpretative (Gee, 2011), explanatory (Wodak, 2004), and inferential (Schiffrin, 1994), therefore allowing researchers to interpret the possibilities motivating certain speech acts that are sometimes even unknown to the language user (Fairclough & Wodak, 1997; Stubbs, 1983).

As shown in this dissertation, the qualitative nature of discourse analysis allows researchers to deductively capture the complexity of realities embedded in language and to understand how to make sense of them (Strauss, 1987). Meanwhile, the accompanying

quantitative approaches allow researchers to statistically verify as well as visualize the patterns of distribution of the discourse features in question. This dissertation is deeply rooted in the principles of discourse analysis that Gee's (2011) succinct and effective characterization of the process as the study of language relative to the context in which it is used could very well describe this dissertation, a take I hope readers would share as they go through the chapters.

Table 2.4 is a preview of the three specific discourse analytic approaches used for each of the three core areas of this dissertation. The specifics for each approach are further detailed in the respective chapters.

Table 2.4: Analytic approaches used in each of the three core chapters

	Data (Type)	Discourse analytic approach
Chapter 3: Policymakers	California opioid policies (written data)	Corpus-based discourse analysis[a]
Chapter 4: Physicians	Audio-recorded WCMC consultations (spoken data)	"Data-driven" or "Theme-oriented" discourse analysis of interactions[b]
Chapter 5: Patients	Audio-recorded WCMC consultations (spoken data)	Prosodic or phonetic discourse analysis[c]

[a](Coffin & O'Halloran, 2005; Flowerdew, 2008), [b](Benkendorf et al., 2001; Roberts & Sarangi, 2005), and [c](Chafe, 1993; Du Bois et al., 1993).

Though there are various strategies for conducting discourse analysis, with all of them revolving around the same overarching themes: (1) context is vital in making sense of the motivations and meanings behind the discourse features in question, and (2) social reality is socially constructed through talk, sign, and writing (see Johnstone, 2018; Van Dijk, 1985; Gee, 2011). As such, this dissertation considers spoken and written public discourses as powerful

social narratives that profoundly influence our understanding of and enactments in the world (Apthorpe & Gasper, 2014; Fairclough, 2003; Hajer, 2002; Johnstone, 2018; Miller & Rose, 1990).

This project contributes to ongoing scholarship in applied sociolinguistics that addresses the language of health policies and social issues surrounding bodies and body conditions (Ball, 2005; Hamilton, 2005; Müller & Guendouzi, 2005; Sabat, 1991). Each of the three studies extends our knowledge of existing literature pertinent to that chapter. For ease of reading, these gaps are addressed in the respective chapter in which the literature is used.

3 Part I: Policymakers

3.1 Introduction

This chapter presents the first of the three core studies in this dissertation, focused on the language used by California policymakers in top-down state policies. As discussed in the introduction, even though modals can be interpreted in various ways, they are constantly found in verb phrases of highly consequential policies. Motivated by the need to understand the role of modality in critical policy issues, this chapter addresses the research question: *What roles do modals play in the framing of opioid policies?*

This chapter proposes two possible functions of policy modals. First, the significant positive correlation between the use of restrictive modals and the worsening opioid crisis suggests that modals reflect the gravity of the issues on the ground. This is further reinforced by a closer investigation showing that the conditions under which restrictive and permissive modals are employed are in sync with the pressing concerns of the time. Second, a closer examination of policy amendments in which modality is specifically altered leads to the understanding that modals can either broaden or limit the terms of existing policies. This chapter contributes to the current body of applied sociolinguistic literature on the relationship between the language of health policies (Hamilton & Chou, 2014; Schrauf & Müller, 2013; Ramanathan, 2010; Sabat, 2006) and local realities (Hornberger, 2006; Ricento, 2009).

This chapter begins with a discussion of the opioid epidemic as a policy issue, followed by an overview of modality and a detailed presentation of the key theoretical concepts laying the groundwork for this chapter's arguments. I then provide a detailed discussion of corpus-based discourse analysis in the context of this study, followed by the findings and a chapter summary.

3.2 Related Literature

3.2.1 Modality

Modals are grammatical features that allow us to carry out one of the most notable features of human language—the ability to express our attitudes, truths, and stances as they are displaced in time and space (Bhatia et al., 2008; Hacquard, 2016; Portner, 2009). Thus, modals are a popular choice for framing policies and any other discourses referencing future events. In fact, as shown in Asprey (1992) and Garzone (2013), modals are highly salient in policy verb phrases, even if their polysemous properties can result in different interpretations of essential healthcare policies. The vagueness and uncertainty created by American policymakers' excessive use of modals pose problems for stakeholders tasked with interpreting and carrying out these policies addressing severe health concerns such as the opioid crisis and other health epidemics. This warrants a closer investigation of modality's role in today's policies.

The semantics of modals has been well discussed through their deontic (root or intrinsic) and epistemic (extrinsic) interpretations, as summarized in Table 3.1 (Coates, 1983; Saeed, 1997; Werth, 1999; Kratzer, 2012).

Table 3.1: Deontic and epistemic modal interpretations

Interpretation of modals for the sentence *"You ____ take opioids."*

Modal	Deontic interpretation		Epistemic interpretation	
Can, Could Might, May	Ability/ Permission	You have the ability/consent to take opioids.	Possibility	It is a likely that you are to take opioids.
Must, Should	Obligation	You have the responsibility to take opioids.	Necessity	It is compulsory that you are to take opioids.
Will, Shall, Would	Volition	You have the commitment to take opioids	Prediction	It is projected that you are to take opioids.

Thompson's (2001) analysis of modal variation within academic writing argued that, although distinguishing between deontic and epistemic forms can be informative, such classification offers little information about when or why one would choose one modal over another to communicate meaningful messages. This observation prompted Thompson to look at modality based on the range of rhetorical functions thesis writers aim to perform when using modals. Such a model allowed Thompson to quantify modal usage to discuss their overall role in thesis writing. This chapter takes on a similar, 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.

3.2.2 Possible pragmatic functions of modals in policies

Modals mirror realities. In his study of modality within political discourse, Chilton (2004, pp. 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

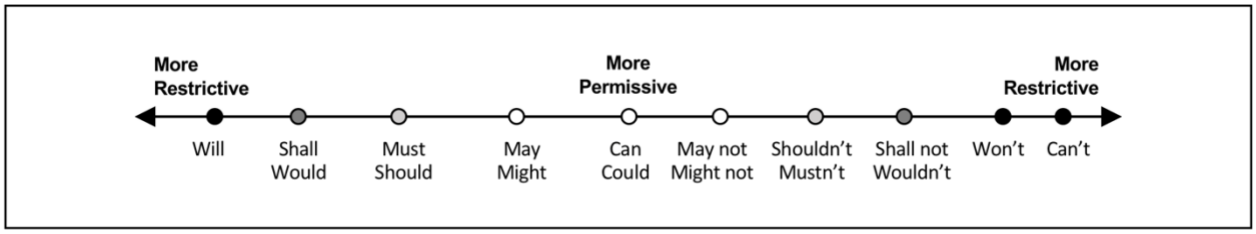
frame as such. Using this model, the statement "I will visit the doctor tomorrow" involves a language user employing *will* to express a high degree of confidence toward the proposition because visiting the doctor is correct in their reality. Therefore, choosing a different modal, such as *might*—as in "I might visit the doctor tomorrow"—evokes a meaning that is further from their truth. With modals as a grammatical feature that expresses force and realities, policymakers' modal choices could indicate their perceptions toward the severity of local issues and the actions they seek to address them. As such, this chapter renders the concepts of modal axis and realities into a policy perspective to propose that modals mirror the seriousness of local issues.

Modals restrict and permit interpretation. Searle (1983) was among the first to relate Austin's (1962) concept of speech acts to the idea of rules, stating that promising, as a speech act, creates an obligation to enact a proposition. Meanwhile, Boyd and Thorne (1969) were among the first to make connections between speech acts and modals—describing the latter, particularly in imperatives, as illocutionary forces that assert, permit, and lay obligations, among others. Lyons (1977, p. 805) further advanced the idea by describing modals as "illocutionary force operators" expressing varying levels of commitment. Although using different terminologies, subsequent studies agree that the concepts of restricting and permitting are speech acts that come with interpreting modals. For instance, Talmy (1988) suggested that some modals are best understood as the mediation between barriers and physical forces that *forbid* or *allow*. Sweetser's (1990) reinterpretation asserted that the implication of these forces could additionally be intentional because modals can add or reduce barriers to either *stop* or *let* specific outcomes. More recently, Chilton (2004) used the terms *command* or *prohibit* to describe the same speech acts associated with modals specifically found in policies. Chilton (2004) argued that—although modal interpretation is contingent upon prevailing norms at the time of use—there are

undeniable prevailing patterns that allow modals to be represented in some form of scale (see Figure 3.1). Simply put, Chilton (2004) implies that, although interpretation varies, we do not think of the modal *may* the same way we interpret *must* or *shall*. This chapter 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*. The current chapter 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 3.1 combines findings from key literature, including Boyd and Thorne (1969), Chilton (2004), Saeed (1997), and Werth (1999), on the restrictiveness and permissiveness of modality.

Figure 3.1: Modal scale based on strength of restriction and permission



Note: Summary of key literature on modality. Policy modals become stricter as they reach both ends of the scale.

Modals found to allow for the most expansive set of interpretations are in the center, while those intended to be perceived as more restrictive are found toward both ends. For instance, 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*, which carry an obligatory implication restricting stakeholders from certain actions. In making sense of modality's potential role in policies, this chapter draws on modality's ability to communicate discourses intended to prohibit or permit particular actions. Using specific examples from

California opioid policies, this study suggests that another potential function of modality in policy discourse is to either permit or restrict certain actions through highlighting or deemphasizing a policy's suggestive intent, respectively.

3.2.3 Context models and frames

Two relevant frameworks assisting the analytic process in this chapter are (1) context models and (2) frames.

Context models. Van Dijk's (1999) 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 (p. 131). Thus, the context model framework serves as the guiding principle for the DA conducted in this chapter. The four contextual categories in Table 3.2 were conducive to the analytic process in this chapter.

Table 3.2: Context model framework

Category	Information sought	Purpose in this study
Time	When was the policy chaptered?	Mapping patterns of modal usage across time and connecting the language or framing of policies to local realities
Location	Where is the policy enacted? (In the sample study, California is the controlled variable.)	Identifying the constituency to whom policies are addressed keeps the study focused, providing added context on what motivates policies, and identifying the locality that may benefit from the implications in this study.
Participants (Policy stakeholders)	To whom are the policies addressed?	Identifying stakeholders to provide insight into the fairness of policies and the diversity of individuals whose agencies are either limited or empowered by policy modals.
Action (Policy action)	What is the policy about? The proposition is introduced by the modal and main verb.	Identifying the specific actions policymakers want stakeholders to accomplish provides context into the pressing societal issues triggering the use of restrictive modals.

Note: Four schematic categories accounted for when designing a discourse analysis study of policies

Frames. Fillmore (1975) describes frames as "schemata" that structure one's understanding and interpretation of linguistic expressions and symbolic units such as text (p. 123). 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) 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 (p. 29).

(a)

"The doctor *may* prescribe me opioids for chronic pain"
MODAL MEDICATION

For example, sentence (a) above has *opioids* occupying the *MEDICATION* frame. For the language user who chose *opioids* out of potential alternatives, the word evokes a frame in which a semantic unit called *opioid* is "a medication prescribed for chronic pain." Similarly, the cognizer could also arrive at their own interpretation of the sentence based on their knowledge of opioids. For example, the receiving end of the sentence may assume that the speaker is suffering from intense pain if they know that an opioid is a controlled substance reserved for relieving intense pain.

The speaker must have implicitly qualified all possible modals to decide on *may* over potential alternatives to occupy the *MODAL* frame. In addition, the knowledge a language user has on the words *prescription*, *chronic pain*, *narcotic*, *controlled substance*, or *painkiller* also affects their level of certainty and, thus, modal choice. Similarly, a cognizer from the 2020s who has knowledge of the opioid crisis may have a different interpretation of the sentence than a cognizer from the 1970s, when the public was told that opioids were safe. Simply put, frames allow us to become actively involved in giving meaning to various linguistic texts, such as policies, using our personal knowledge, memories, and experiences at that point in time.

Both frameworks inform the analysis in this chapter. The context model framework systematically reveals information about the policies, allowing a more vivid representation of how the language of policies connect to the locality. Meanwhile, the notion of frames prove that words fulfill certain roles because they were chosen over competing possibilities to occupy a frame, legitimizing the type of argument made in this chapter.

3.3 Methodology

3.3.1 Data

A total of 223 state policy documents (comprising 110,108 total words) enacted between 1970 and 2019 were gathered from California's legislative archives using the following primary keywords: *opioids*, *controlled substance*, *schedule II*, and *narcotic* (see Appendix A for a complete list of policies).

3.3.2 Corpus-based discourse analysis

As discussed in Section 2.4, the overarching approach implemented in this dissertation is discourse analysis. The specific approach used for the policy analysis in this chapter was corpus-based discourse analysis (CBDA)—a method widely used in applied sociolinguistic research because of its capacity to analyze large data sets through both quantitative and qualitative techniques. Corpus analysis (CA) provides a quantitative textual analysis of specific grammatical features, revealing the salient patterns that require closer examination through discourse analysis (DA) (Baker, 2006; Orpin, 2005; Stubbs, 1996). Discourse analysis allows researchers to look beyond the patterns revealed by corpus analysis. As Lian (2020, p. 138) pointed out, "applying a corpus-assisted approach to the language of lawmakers can provide a glimpse into the ideologies of policymakers and politicians who create legislation." Because CBDA can be carried out in various ways, I have outlined the four specific steps undertaken in this analysis.

Step 1: Creating a timeline. As indicated by Strauss and Corbin (1997), creating a data narrative makes a valuable backdrop against which the discourses under investigation can be grounded. For this chapter, the analysis is conducted against the three phases of the opioid crisis timeline, which was discussed in detail in Section 2.3. As a refresher, Figure 3.2 summarizes

some key policies under each phase, while Figure 3.3 shows the rising number of opioid-induced fatalities in California.

Figure 3.2: Select policies representing the three phases of the opioid crisis timeline

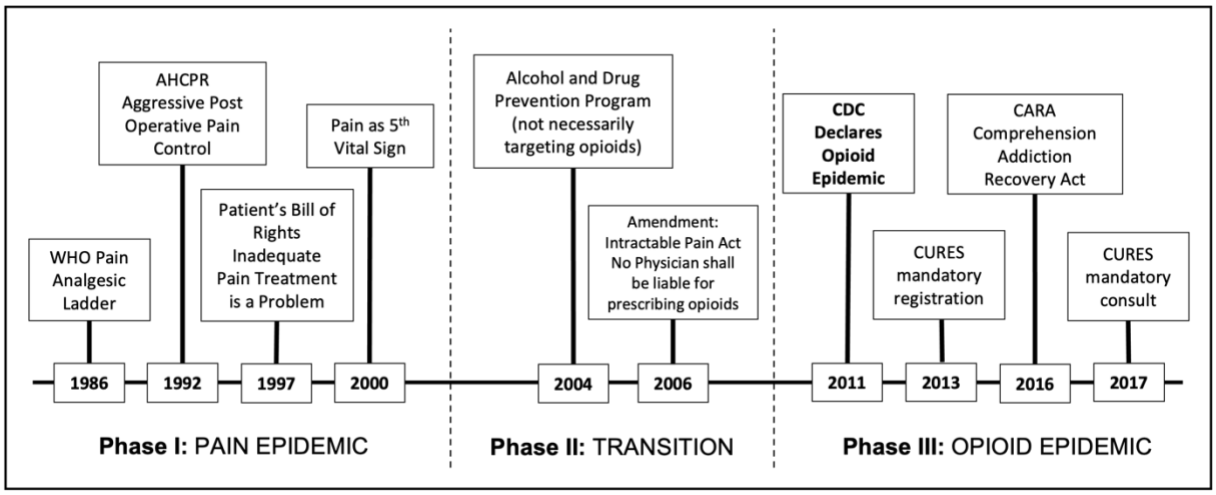
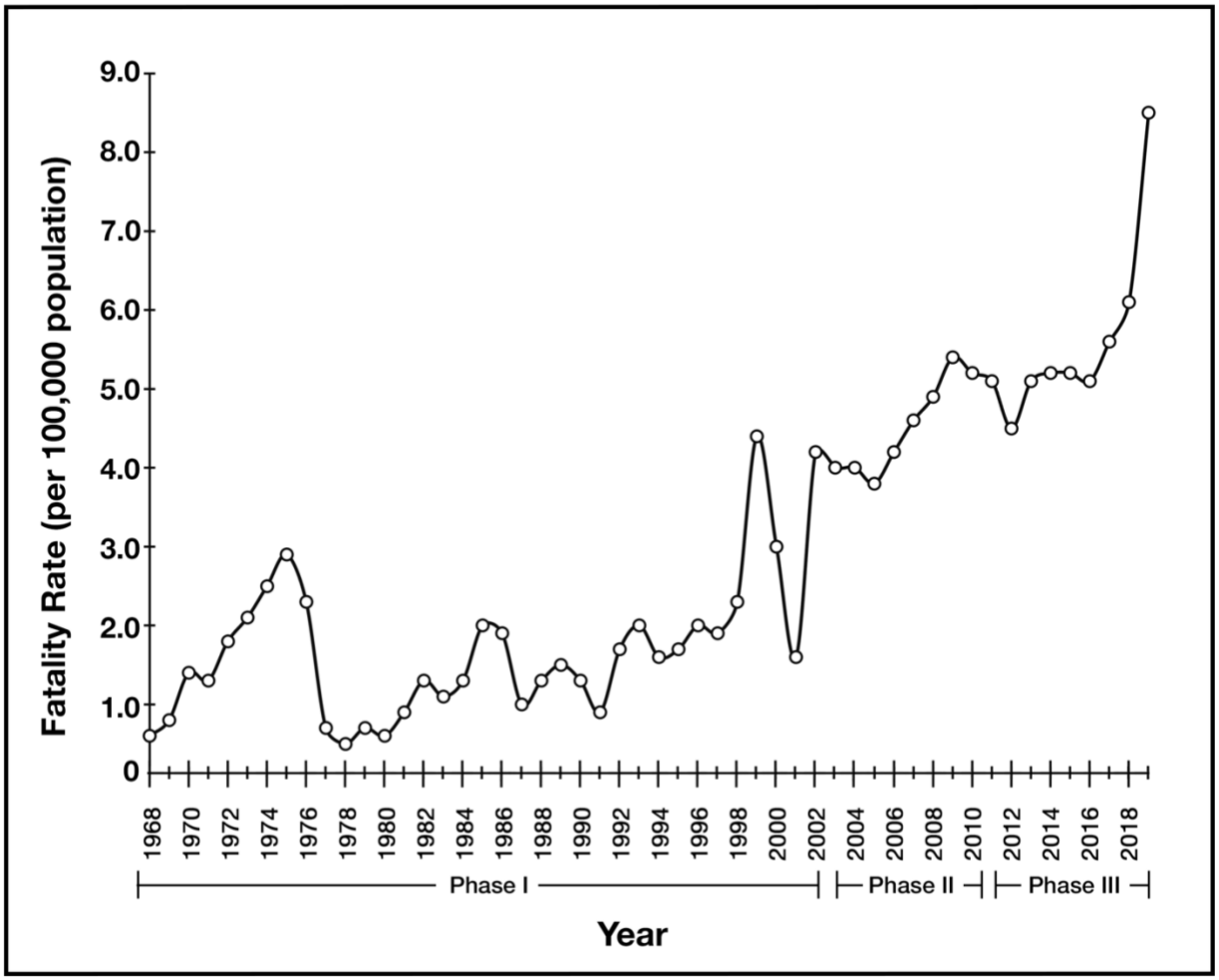


Figure 3.3: Number of opioid-related fatalities in California (1968-2019)



Note: Crude rates—death rates per 100,000 population—are used when age-adjusted rates are not available. Data was gathered from the CDC WONDER database.[4]

Step 2: Frequency analysis. After establishing the backdrop, the study focused on the language of California opioid policies. The frequency analyses performed in the study tracked the behavior of modality and its correlation to the worsening opioid crisis. Modal frequencies

[4] 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.

were generated using MAXQDA, while statistical analyses were performed in SPSS (Version 26). The corpus was divided into a subcorpora of original policies and another made up of amendments to avoid conflating frequencies. In addition, the changes in all preceding and ensuing versions of amendments were carefully compared in order to account for newly added, deleted, and changed modals (Section 3.4.3). The patterns of restrictive and permissive modal usage that emerged from the frequency analysis helped guide the direction of the remaining study. Analysis of variance (ANOVA) and regression analysis were conducted with the frequency of permissive and restrictive modals as dependent variables and with time and fatality rates as 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 & Fieller, 2014).

Step 3: Coding for policy participants and purpose. Three coders trained in discourse analysis identified the policy stakeholders and purpose of the clauses in which modals were used. The process was informed by Van Dijk's (1999) context model framework (Table 3.2). Using axial coding (Strauss & Corbin, 1997), coders identified the major themes as they emerged from the corpus and finalized the categories as connections between themes became more apparent. This coding process allows for data to naturally fit into categories instead of forcing them into pre-determined groups that may not necessarily be accurate representations of the data. Tables 3.3 and 3.4 present the coding categories used in this chapter.

Table 3.3: Policy stakeholders addressed in California opioid policies

Major entities addressed in policies		Description	Examples
A	State departments	Local institutions, including sectors of state government, whose responsibility include public health concerns	California Department of Health Care Services, California Department of Justice, Drug Enforcement Administration, California Department of Social Services, California Health and Human Services Agency
B	Health care providers	Medical providers licensed to furnish and dispense opioids	Physicians, surgeons, dentists, pharmacists, paramedics, EMT personnel, nurses, midwives, emergency responders, physician assistants, anaesthetists, etc.

Note: These two categories were used in coding the stakeholders addressed in policies.

Table 3.4: Major themes describing the content of opioid 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 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.

Note: These five categories were used in coding the predicates or the intended actions to which modals were linked. For specific examples, see Appendix C.

Coding was done in tandem, which allowed coders of health-related data to offer their expertise, discuss differences, and keep each other consistent (see Henry et al., 2020; Hood-Medland et al., 2021). This method steps away from blindly going with the majority's code and allows those in the minority to explain their coding decisions. For example, the coders in this study debated whether a certain policy's purpose is to address substance abuse or guide state diversion programs. After listening to each other's reasoning, the coders realized that both

themes have the same intended outcome, thus, creating a category for diversion policies. Because the recipients and the contexts of the policies were mostly evident in the text, it would be inefficient to code separately only to convene later and discuss the disagreements, since coding in tandem accomplishes this immediately. Chi-square tests of restrictive and permissive modal distributions throughout each phase were conducted as well to measure any significant correlation between modality and the context in which it is used.

Step 4: Discourse analysis. Finally, the patterns that emerged from CA helped guide the focus of the DA. I conducted a close reading discourse analysis of the policies, with a particular focus on the amendments of chaptered statutes. I specifically look at instances in which only the modal verbs were changed while the rest of the clause remained constant. Using discourse analysis to *interpret* and *explain* the motivations behind policymakers' decisions to change the modals with respect to the severity of the crisis at the local level, I illustrate modals' capacities to (1) reflect the gravity of local issues and (2) either highlight or deemphasize a policy's suggestive intent (Section 3.5).

Thus far, the CBDA of modals has mostly covered second language writing (Aijmer, 2002; Biber, 2006; Chen, 2012; McDouall, 2012). One of the aims of this chapter is to extend the breadth of CBDA research to include language and policy planning research, most of which has been carried out using qualitative discourse analysis.

3.4 Results

3.4.1 Modal frequency indicates restrictive-permissive policy distinction

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 3.5).

Table 3.5: Modal frequencies in original policies and amendments

Original Policies (*n = 30,013 words*)				**Amendments** (*n = 80,095 words*)			
	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

Note: 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.

Table 3.5 reveals that *shall* and *may* are the most used modals of California policymakers in framing the state's opioid policies. As presented earlier in Figure 3.1, *shall* and *may* are found toward the restrictive and permissive sections of the modal scale, respectively. 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 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* as well as 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.

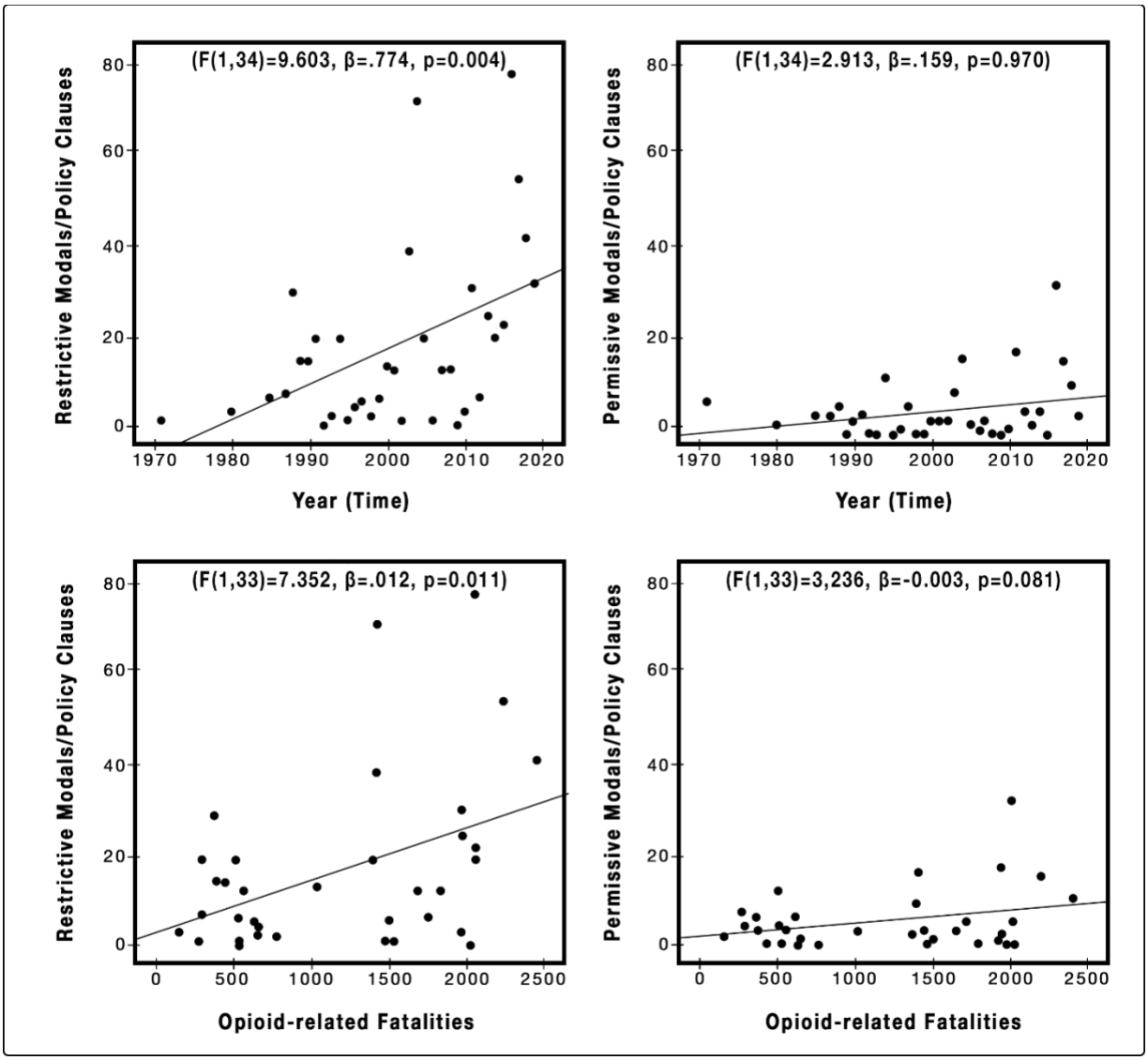
3.4.2 Modal distribution suggests restriction-crisis severity correlation

The study uses time and fatality rates to represent the worsening crisis as the issue continues to be increasingly fraught (Torres et al., 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 $p < 0.050$ and a non-significant correlation with the increase in permissive modals at $p < 0.050$ (Figure 3.4). Note that each modal would have appeared in a unique policy clause; therefore, the frequencies of restrictive and permissive modals are synonymous with the number of restrictive and permissive clauses, respectively. The positive correlation is also supported by the gap between the regression coefficients of restrictive ($\beta = .774$) and permissive ($\beta = .159$) clauses, which means 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 $p < 0.050$ and a non-significant correlation with the increase in permissive modals at $p < 0.050$. The results of the outlier test using the Mahalanobis distance, with a chi-square ($\chi 2$) cut off of $p < 0.010$, revealed one restrictive and two permissive outliers,

all of which were insignificant to the results. All statistical calculations for this chapter can be found in Appendix B.

Figure 3.4: Distribution of restrictive and permissive policies across time/fatality rate



Note: Number of restrictive (left) and permissive (right) modals/clauses across time (top) and fatality rates (bottom)

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.

3.4.3 Modal interchangeability suggests impact on policy interpretation

Amendments could take the form of adding or deleting provisions as well as rewording 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 discretion over releasing a patient's controlled substance history to their respective physician. In contrast, the volitional and predictive nature associated with *shall* coveys 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 modality

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 […]

Note: 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) have 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 the policies are addressed. The following example provides insight into how modals could highlight or hide the suggestive intent of policies.

(2) An example of modal amendment from permissive to restrictive

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]

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

The difference between the two versions in Example (2) is that the permissive *may* gives 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.

The following excerpt shows an amendment in 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 modality

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 […]

Note: 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.

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 could do without an attending physician, including the furnishing of controlled substances, as shown in the example above. With advancements 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 for stakeholders to take.

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

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.

Note: The statute was shortened for brevity, but the changes do not affect the analysis. The rest of the content can be retrieved from the internet through California's legislation website.

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. However, the 1994 version in Example (4) specifies the negation by using *may not* instead of *may*. *May not* is more precise in the sense that it potentially eliminates half 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, the 2017 change from *may not* to *shall not* in the suggests that policymakers agree that both differ. The change implies that the restriction evoked by *may not* 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 suitable 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 a force that *stops* or *allows*. The analysis in this section opens up the idea of modality 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. Additional examples of modal amendments can be found in Appendix D.

The use of modal verbs indicates the presence of subjects/agents and predicates/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 modalities are used. I answer this question in the following section.

3.4.4 Context of modal use mirrors local needs

Informed by Van Dijk's (1999) context model framework (see Table 3.2), 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 3.6 shows the distribution of restrictive and permissive modals across the three phases of the opioid crisis.

Table 3.6: Distribution of restrictive and permissive policies across the three phases

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

Note: As presented earlier, Phases I, II, and III refer to the pain epidemic, transition, and opioid epidemic phases, respectively.

A chi-square test revealed that a significant correlation at $p < 0.05$ exists between the stakeholder and the modal used during Phases I and II. The results denote a higher likelihood for stricter opioid policies directed toward health care providers during the first two phases, when opioid was known as the effective painkiller solving the country's pain crisis. The distribution of restrictive and permissive policies at $p < 0.05$ during the third phase signifies a more balanced distribution of restrictions considering that restrictive policies no longer targeted health care providers. Modal distribution is defined by chance and is, therefore, less predictable than the first two phases. The results also suggest that policymakers initially considered opioid-related issues as concerns confined within hospital walls but later changed their perspectives as state department employees become more active participants in the state's opioid narrative.

Table 3.7: Policy actions and their percentage share of restrictive policies

Policy Action	Percent 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	59.0	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)

Note: As presented earlier, Phases I, II, and III refer to the pain epidemic, transition, and opioid epidemic phases, respectively. Numbers in parenthesis indicate percent of change from the preceding phase.

Policies framed using restrictive modals hint at the actions policymakers consider to be priorities at that particular time, as the they are important enough to warrant such phrasing. The findings in Table 3.7 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, evident from 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.

3.5 Discussion

In its entirety, the findings in this chapter suggest two potential functions of modals in policies: (1) mirroring or calling attention to the gravity of the issues happening on the ground and (2) reconfiguring the interpretive spaces in which stakeholders operate. The frequency analysis of the corpus revealed *shall* and *may* to be 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 suggests 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 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, p. 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." Chilton (2004) further emphasizes that perceptions of local realities influence one's modal choices. Pairing these two ideas together helps make sense of policymakers' overwhelming decision to use *shall* over alternatives as the opioid crisis worsens.

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—in which stakeholders negotiate the meanings they make out of the collective semantic prosody evoked by policies—as "interpretive spaces." An alternative term could be "implementational

spaces," as 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, influencing the implementational spaces where stakeholders enact policies.

Some may find it beneficial to learn the motivations behind modal use from the policymakers themselves. While such information could inform the current study, the study design does not necessarily agree that such information is useful, because the job of discourse analysis is to *interpret* and *explain* the set of possibilities motivating speech acts, which are sometimes unknown even to the language user (Friginal & Hardy, 2020; Johnstone, 2018; Fairclough & Wodak, 1997). Nonetheless, the policymakers involved were contacted, though the attempts ended up being unsuccessful. It should also be reemphasized that discourse analysis serves as the backbone of the coding process, and, in turn, the frequency analyses, because such an approach can be less apparent when quantitative results are presented.

3.6 Summary

This chapter focused on policymakers' use of modal verbs, a salient grammatical feature found in policy verb phrases. Through corpus-based discourse analysis, the chapter analyzed the patterns in policymakers' use of modality as the crisis worsens. Part I revealed two potential functions of modals: to reflect the gravity of the issues on the ground and to manipulate the interpretive spaces through which stakeholders make sense of policies. Specifically, restrictive modals limit the terms of existing policies while permissive alternatives broaden them. Part I shows that focusing on modality can provide researchers with valuable information about the current state of the locality, including who is being targeted in such policies and for what reasons. Such information has potential to save policymakers and researchers valuable time examining the policies of pertinent local issues.

4 Part II: Physicians

4.1 Introduction

This chapter covers the second of the three studies that make up this dissertation. Shifting gears from the top-down policies discussed in Part I, this chapter examines the language used by WCMC physicians while communicating with patients during medical consultations. As indicated in the introductory chapter, Part II focuses on face-work and answers the research question: *What face-saving discourse features emerge from physicians' enactment of opioid policies?* Informed by interactional sociolinguistics and sociopragmatics, this chapter uses discourse analysis to bridge policies to local interactions by outlining the discursive practices physicians employ while carrying out—what Part I describes as—increasingly restrictive opioid policies. For physicians, fulfilling policy demands, especially those restricting patients' access to opioids, could result in tense exchanges, conceivably jeopardizing the collaborative relationships between physicians and patients that many studies deem necessary for effective pain management (see Fishman, 2016; Henry et al., 2016).

The analysis of this study is also couched within Goffman's (1955) concept of face-work—that is, the constant negotiation, construction, and protection of the social persona one desires, as well as that of their listeners. A total of eight salient face-saving discourse features were observed during the physicians' enactments of the three consistent or reoccurring policies across all analyzed interactions.

Recognizing the challenges physicians face during consultations could inform future opioid-related medical visits. Moreover, examining how physicians use language to interpret and enact opioid policies informs us of the dilemmas physicians face, as they know very well that

their adherence to policies may result in the non-compliance of patients. This study locates itself within the burgeoning body of work interested in using discourse analytic approaches to understand the meaning-making process involved in local health policy enactments (Martinez, 2008; Davis & Pope, 2010; Higgins, 2010; Evans-Agnew et al., 2016).

4.2 Related Literature

The stigma that comes with discussing opioids and addiction has made healthcare communication surrounding pain fraught with difficulties (Arborelius & Thakker, 1995) for both providers (Thakur et al., 2021; Matthias et al., 2013) and patients (Torres et al., 2020; Roberts & Kramer, 2014; Henry et al., 2017). Patients taking opioids claimed that they were made to feel as if they were "drug addicts," "junkies," and "heroin users" (Dassieu et al., 2021, p. 5). Meanwhile, physicians found opioid discussions to be equally complex, citing reasons such as fear of resistant behavior (Mistral & Velleman, 2001), distrust of patients who initiate opioid-related conversations (Hughes et al., 2015), doubt of patients' willingness to disclose substance dependence or abuse (Ford, 2011; van Boekel et al., 2013), and lack of training (Klamen, 1999).

Byrne and Long's (1976) pioneering work on doctor-patient discourse highlighted that primary care visits often follow a prescribed order: question, answer, and evaluation. Mishler (1984) adds that conversational templates naturally emerge from such highly ritualized interactions (see also Ainsworth-Vaughn, 1998; Heritage & Maynard, 2006). However, the transition to a highly individualized patient-centered approach has challenged such a simplistic view of health transactions. According to Stivers (2002, p. 1111), "much of the existing health care and health policy research recommends parent/patient participation in healthcare decisions." Patients acting as full partners in treating their chronic conditions enables healthcare

to be delivered more effectively and efficiently (Holman & Lorig, 2000, p. 526). A patient-centered approach in intricate and morally-charged issues such as opioids poses a challenge to physicians who have to negotiate the line between enforcing restrictive policies with which patients disagree and maintaining collaborative relationships. This literature review begins with a discussion on face-work and threats, followed by an assessment of previous literature on face-saving strategies found in doctor-patient interactions.

4.2.1 Face, face threats, and face-work

Erving Goffman (1955, p. 213) is the pioneering theorist who conceptualized face as an individual's desired "positive social value" derived from "approved social attributes." Goffman, whose research in psychiatric wards exemplifies the shared history between face and medical interactions, described the harmful or inaccurate portrayal of one's face as "threats" (p. 217) and the actions one takes to maintain or save face as "face-work" (p. 216). Brown and Levinson's ([1978]1987, p. 13) elaboration of Goffman's thesis suggests that face is just as attributed by other interactants as it is self-claimed. To bridge face with their politeness theory, Brown and Levinson ([1978]1987, p. 61) differentiated "positive face" (or the "desire to be appreciated") from "negative face" (or the "desire to be free from imposition") as motivations for politeness—the mitigation, avoidance, disarming, and presupposing of "face-threatening acts" (FTAs). Though Brown and Levinson's contributions served as a sounding board providing depth to subsequent face research, their work also received criticism for its incompatibility in cross-linguistic discourses (Terkourafi, 2012). Their claim that politeness is more than the display of courtesy and good manners may have contributed to the oversimplification of the term and its use as a regular stand-in for face-work in subsequent medical interaction research. Spiers (1998, p. 31), for example, defines politeness as a means for practitioners to minimize the threats to a

patient's negative face (or, in lay language, their autonomy), to cushion the weight of awkward and negative news, to cover embarrassment, anger, and fear, and to ease the intensity of commands and questions. O'Driscoll (2011, p. 19) criticized Brown and Levinson's sometimes interchangeable, sometimes causal treatment of face and politeness, arguing that face is a trait that speakers *own* while politeness is a behavior that speakers *do*. Similarly, Watt (2003, p. 95) rejects the causal relationship, citing instances in which face-work is neither the sole motivation nor explanation for politeness. Watt argues that the context-specific nature of politeness means that it has to be subjectively identified over multiple speech events, a process considered in the analysis of this chapter.

While there are considerable disagreements concerning the definitions and scope of face, face-work, and politeness, there seems to be consensus in acknowledging these concepts as dynamic (Locher, 2011), interconnected, co-constructed (Haugh, 2007; Bucholtz & Hall, 2005), contextual (Culpeper, 2011), and culture-specific (Spiers, 1998). For this dissertation, I have adopted Spencer-Oatey's (2006, p. 14) holistic interpretation of face as describing one's "sense of worth, dignity, and identity, associated with issues such as respect, honor, status, reputation, and competence." This study's goal to identify face-work strategies, whether or not their subjective function is to express politeness (good manners), resonates with O'Driscoll's (2011, p. 19) belief that politeness is an aspect of face. This study also considers that the overwhelming research highlighting the effectiveness of collaboration in transitioning patients from prescription opioids to alternative treatments (see Henry & Matthias, 2018) serves as a catalyst motivating physicians' use of face-work.

4.2.2 Face-work in medical discourse

Even without the opioid epidemic, the very nature of the occupation already forces physicians to initiate exchanges that could be threatening to either their or their patient's face, such as asking personal or sensitive questions, discussing value-laden and frightening topics, providing potentially demoralizing evaluations, and criticizing compliance (Benkendorf et al., 2001). Aronsson and Sätterlund-Larsson (1987) compared face-work in medical interactions to social choreography, as patients and physicians must constantly dance around the discussion of socially sensitive topics through tactics such as indirectness (e.g., embedding criticisms and requests into jokes and suggestions), hedging their words through modals, preemptive apologies, pausing, and back-channeling. Ultimately, Aronsson and Sätterlund-Larsson (1987) argue that such a dance begets negative consequences on the joint decision-making of patients and physicians.

Past studies on face-work as a pragmatic strategy employed in medical conversations focused primarily on discourses involving unpleasant news. Lutfey and Maynard (1998) studied the language used by oncologists as they broke the news that their patient's cancer is no longer treatable. They identified the physician's use of euphemisms and allusions through cautious word choices and avoidance of the words *death* and *dying* as face-saving features. Similarly, Wilkinson and Kitzinger (2000) observed the redirecting of cancer talk toward positive thinking and found the use of words such as *positive* and *positively* as discursive coping mechanisms used by female patients in focus group meetings. Epstein et al. (1998) found more evidence of incoherence and fractured speech in physician speech when discussing more sensitive and charged topics such as HIV. They also found that physicians often wait until patients are willing to discuss their sexual history before starting conversations about getting HIV tests.

Caffi's (1999) analysis of doctor-patient transcripts in Italian exposed physicians' use of downtoners or mitigators such as *by any chance* or *incidentally* in asking difficult questions, the inclusive *we* in lessening social distance and cushioning the weight of mandates, quotational shields or the presentation of an expression "in quotes" and discourse markers such as *let's say* in distancing oneself from embarrassing and painful topics. Clark and Hudak (2011) studied Canadian orthopedic surgeons who were delivering recommendations against surgery to patients who sought or were sent to them to undergo an operation. They found the use of parenthetical remarks—utterances embedded into ongoing turns—in preempting patient disagreement; tag questions like *You know?* in positioning patients as being complicit to the surgeons' treatment recommendations; brightsides in emphasizing positive aspects of the patient's problem; redirections to standard practice (e.g., saying *what we tend to do*) in mitigating the intensity of recommendation; and general case descriptions (referred to here as *broadening*) in justifying treatment suggestions by positioning patients within or against a group (e.g., referencing *younger patients* or *lots of folks*). Stivers and Timmermans (2017) studied geneticists' deliveries of exome sequencing results, which identify potential genetic causes of a child's disability to families. Their findings include the use of brightsides through foregrounding—providing an already implied element of the news such as *at least we did the test.* This chapter adds to current literature that pays attention to the language of medical discussions surrounding sensitive topics and highlights the importance of recognizing and addressing face threats as a critical first step in improving doctor-patient discourse.

The previous chapter showed how the language used in framing opioid policies has become increasingly restrictive as the epidemic worsens in the United States. As stricter policies surrounding opioid prescriptions are implemented, discussions about opioids are becoming more

tense between physicians who are under heightened scrutiny and patients whose opioid treatments are being changed or rejected (Torres, 2021; Henry et al., 2016).

By calling attention to specific linguistic features physicians employ when complying with new health directives, this study contributes a physician-centered analysis to the existing literature on face-work, which has otherwise primarily focused on patient discourses (Ainsworth-Vaughn, 1998). Although this work focuses solely on primary care consultations in California, the study of policy-driven face-work and politeness routines is not unique to the medical space, as it is replicable in almost all workplaces and institutions where policies exist.

4.3 Methodology

This study analyzes three audio-recorded doctor-patient interactions that took place at the WCMC. Table 4.1 outlines some relevant information regarding the participants' linguistic backgrounds:

Table 4.1: Participants' self-identified information

Resident physician Pseudonym	Age	Patient Pseudonym	Age
DOC A	29	PAT A	40
DOC B	28	PAT B	69
DOC C	30	PAT C	52

Note: Patient-physician information was taken from the post-consultation questionnaires. All participants expressed that English is their native and preferred language in medical appointments. In the excerpts presented, COM stands for patient companion while ATT stands for attending or faculty physician overseeing the resident.

The logistics involved in recruitment and data handling are compliant with the criteria outlined in the Health Insurance Portability and Accountability Act (HIPAA) and were conducted under the guidance and approval of WCMC's Institutional Review Board. Recruitment started with enrolling attending and resident physicians into the study to ensure that

only patients of participating physicians were recruited for this project. In residency clinics and teaching hospitals, "residents" refers to medical school graduates who are continuing their specialty or general practice training under the supervision of a more experienced attending or faculty physician. A total of 30 WCMC physicians enrolled in the study. The next step was to recruit the enrolled physicians' patients who receive prescription opioids for chronic pain. Patients receiving opioids for cancer pain were excluded since the policies and context behind their use of opioids are different and beyond the scope of this study.

Patients were recruited in waiting rooms, after they checked in with the front desk. Once the rooming process of a consenting patient was finished, I entered the examination room to check in with that patient, answer any final questions they may have about the study, and set up the recording device. The recorder was positioned away from the patient's line of sight to minimize any distractions the device may cause and mitigate any possible triggers for observer's paradox (Labov, 1972). Then, I stepped out of the room, leaving only the patient and their companion (if they had one) as they waited for the physician. I was not in the room during the recording to avoid any discomfort for the participants. At the end of the visit, I returned to the room to stop the recording, retrieve the recorder, and administer a post-appointment survey eliciting relevant information on the patient's linguistic background. The average appointment duration was one hour.

Ultimately, three patients who fit the criteria agreed to participate in this study. The choice to look at a small number of participants is appropriate in investigations involving language-in-action, as it requires and allows for a thorough analysis of the discourse features in question and the context in which they are used (Schilling-Estes, 1998).

All physicians and patients self-identified as native speakers of American English and all physicians were considerably younger than their patients. While the consistency of age differences mitigates any potential age-related variation, the focus of this study remains on the discourse features as they emerge from the data. Later in this dissertation, I advocate for future explorations to emphasize sociolinguistic variations among and within diverse groups—from groups based on race and self-identified gender to education and social status, among many others—as more data become available. The outcomes from this chapter are not intended to be descriptive of all opioid-related interactions. Rather, the findings are reported (1) for their potential to inform future interactions of a similar nature and (2) to highlight the challenges institutions impose upon policy stakeholders when not enough attention is given to the language required to implement potentially contentious policy mandates in medical interactions.

Transcripts were prepared by the researcher with the help of three research assistants trained in DA and certified by the Collaborative Institutional Training Initiative. Transcriptions were organized into *speaking turns*—which refers to the entire speech of a specific speaker before another interlocutor mediates and converses (Sacks, Schegloff, & Jefferson, 1974). Such convention fits the data well because physicians enacted the policies one at a time, meaning that all utterances within a single turn would most likely apply to the same policy. Thus, dividing transcripts by speaking turns is an efficient and accessible way of analyzing and representing the data.

The transcribers listened to the recordings and transcribed separately at first, before convening to settle discrepancies between the initial transcriptions, verify consistency of data organization (in speaking turns), and annotate transcripts for context and features.

4.3.1 Policies

Three policies emerged across all interactions: (1) continual monitoring of opioid use, (2) co-prescribing naloxone, an anti-overdose medication, and (3) weaning patients off opioids and finding effective alternative treatments for pain. These policies are outlined in WCMC's policy on opioid prescribing and monitoring in adherence with state-chaptered policies outlined by the Medical Board of California (Brown Jr et al., 2014). The three policies mentioned are also detailed in WCMC's Patient-Prescriber Agreement that patients and physicians are required to sign prior to starting an opioid regimen. While these policies are overt (or *de jure*), the same set of policies would have emerged if the unwritten (or *de facto*) policies were to be derived from simply observing the consistent and recurring practices across all data (see Section 2.1 for different types of policy). As mentioned at the top of this chapter, though physicians are simply acting in accordance with these policies, patients may perceive such actions as distrusting, shaming, and doubtful of their pain and suffering.

4.3.2 Data-driven or theme-oriented discourse analysis

As previewed in Section 2.4, discourse analysis is the primary approach implemented in this dissertation. According to Woods (2014, p. 121), discourse analysis allows researchers to examine potential motivations behind the language choices of health care providers, especially in tense situations involving unwanted or traumatic news. Woods also notes that the general advantage of using discourse analysis is that it captures the complexity of medical interactions in a way that can be made accessible to a general audience, including health care providers, without diluting the substance.

The specific analytic approach used in this chapter is essentially the same as Benkendorf et al.'s (2001, p. 202) "data-driven approach" and Roberts and Sarangi's (2005, p. 632) "theme-oriented approach" to the study of medical encounters. The procedures are as follows:

> (1) With the help of the transcripts and recordings, speaking turns in which opioid policies were enacted were identified. These turns were inspected for discourse features that have been established in previous literature, some of which were introduced in Section 4.2.2 (e.g., discourse markers, downtoners, broadening, topic shifting, backchanneling, pauses, delaying, and restarts, among others) as well as other potentially meaningful communicative patterns found in the data that are not as prominent in previous literature on face-work and medicine. The features observed were then systematically organized as connections and similarities among them became apparent. This inductive process maximizes the information the data has to offer, as it allows the data to dictate the "categories" of discourse features rather than forcing them into pre-identified ones that may not even be relevant to the data.
>
> (2) The physicians' discourse features are considered face-work strategies if one of their functions is to maintain or save their own or their patient's face. To understand what, how, and why words or phrases were chosen requires understanding what these choices intend to accomplish. The range of functions served by each face-saving discourse feature was assessed to make sense of the linguistic choices made by the participants in this study. This strategy is derived from Van Dijk's (1999) context model framework, which was used in Part I (see Table 3.2).

Shaw and Bailey (2009, p. 413) emphasized that discursive findings are assessed for the theoretical rather than statistical knowledge they offer. In this chapter, discourse analysis helps identify the various context-specific linguistic features used by WCMC physicians to discuss opioid policies, allowing physicians everywhere to reflect on their own enactment practices and adapt ways to linguistically overcome the burden of negotiating face-threatening situations without compromising the partnerships they have established with patients, which is vital for successful intervention.

4.4 Results

Eight face-saving features emerged from the physicians' speech as they enacted the three WCMC policies outlined in Section 4.3.1. These findings are summarized in Table 4.2.

Table 4.2: Face-saving acts used by physicians to enact WCMC's opioid policies

New WCMC opioid policies	Pseudo requests	Downtoners	Broadening	Redirection	Tag questions	Impersonalization	Listing	(Negative) Imagery
1. Continual monitoring/heightened surveillance of opioid use.	✓	✓	✓	✓	✓			
2. Co-prescribing anti-overdose medication with opioids.		✓	✓	✓	✓	✓		
3. Weaning patients off opioids and starting alternative treatment.			✓	✓	✓	✓	✓	✓

Each of the next three subsections provides more context on the three policies and the corresponding face-saving acts that were observed from the physicians' speech.

4.4.1 Continual monitoring of opioid use

The worsening opioid epidemic has led to a heightened surveillance of opioid prescribing. Physicians at WCMC must subject patients to routine drug tests to ensure that they adhere to the agreed upon opioid regimen. Enacting this policy prompts various face-saving acts from physicians.

Pseudo requests. One of the face-saving acts physicians used is making pseudo requests—i.e., imperatives and mandates presented as requests and suggestions instead of direct, declarative commands (Benkendorf et al., 2001). Excerpts (A) and (B) show examples of how the physicians initiated the discussion of drug tests, with bolded text representing pseudo requests:

(A)

A1	DOC 3:	Okay, I'm gonna go talk to my attending, but my instruction for you today is that, **maybe you have time to go upstairs to do some quick labs?**
A2	PAT 3:	[[Laugh and some incomprehensible speech] Why don't you just … keep me here?
A3	DOC 3:	[Laughs] No no, we're just talking about it, okay? So deep breaths. It should be really quick, I know it's been a lot for you today. It's just, you know, it's just, it's our policy and it's a government mandate to do these labs if you're getting prescribed with narcotics. It's all for your safety.
A4	PAT 3	[inaudible] killing me. No. [laughing] I'm joking.
A5	DOC 3:	It's, it's just rules, you know? And I know you've been a good patient. It's just routine unfortunately. In fact, we uhh it's, it's in our contract, remember?
A6	PAT 3:	I understand that … and I appreciate that, thank you very much.

(B)

B1	DOC 1:	Okay. Give me, give me just a second. They're also going to give you the flu shot, and **we'll have to do a urine test. Is that okay with you?**
B2	PAT 1:	Uh huh.
B3	DOC 1:	All right, give me just a second. [Physician leaves then re-enters the room.]
B4	DOC 1:	All right, and then **we can check, can you get your lab checked real quick upstairs?**
B5	PAT 1:	Mmm … no, I'm already runnin' too late.
B6	DOC 1	Okay, yeah, all right. Well, I'll just leave it there, and then next time you can get it checked.

The imperatives in Lines A1 and B1 started in declarative yet ended in interrogative form. Line A1 started with "my instruction for you today, is that" followed by the word "maybe" before pivoting and concluding the turn with rising intonation. Similarly, Line B1 started with the modal phrase "(we)'ll have to do" to appropriate some sense of necessity to the urine test before completing the turn with the question, "Is that okay with you?" With the need for regular drug testing already incorporated into the patients' agreements, physicians did not necessarily need approval when subjecting patients to drug testing. However, posing the mandate as a question mitigates the intensity of the command. This observation is in line with Benkendorf et al.'s (2001) study of counseling discourse, which shows that genetic counselors use pseudo requests to politely facilitate their clients' decision-making to make it seem like they arrived at decisions together. While treating patients as individuals with agency could help foster collaborative relationships, framing mandates as requests make them vulnerable to rejection, as what happened in Line B5, when PAT 1 declined the test, saying, "No, I'm already runnin' too late."

One quality of pseudo requests observed from the data is that they can be further embellished with other mitigating tools. For instance, positioning "flu shots" and "urine test" as near collocates in Line B1 created some sort of pragmatic equivalency, suggesting that the test is as mundane of an activity as getting flu shots.

Another noteworthy quality of pseudo requests found in the data was that they co-occurred with discourse markers such as "okay" and "umm" in Lines A1 and B1. Beach (1993, 2020) wrote extensively about oncologists' use of discourse markers like "okay" as transition devices that delicately end a patient's extended turn while simultaneously signaling alignment, as patients feel heard (see also Beach & Dixson, 2001). The data in this chapter substantiates Beach's findings and adds pseudo requests to the list of topics medical providers can transition to using "okay." In both excerpts, the physicians were changing the topic and ending their patients' extended turns—PAT 1's turn about possibly calling the doctor if her legs get better and PAT 3's about spending an entire day pondering the risks of opioids.

Broadening. I use the term *broadening* to collectively refer to the set of discourse features that, when used, broadens or widens the scope of the ongoing discussion. Specifically, the physicians used the following face-saving broadening tools:

1. Lexical items referring to patients' group memberships to expand or generalize the intended audience of strict policies;
2. Inclusive pronouns *we* and *our*, to widen the scope of policy participants;
3. Modal verbs to introduce optionality and expand the range of possible policy interpretations.

An example of audience generalization can be found in Line A3, as DOC 3 responded to the patient's protest by stating that everyone prescribed opioids is subject to lab testing. Doing so allowed DOC 3 to clarify to the patient that the testing is not an isolated case meant to single them out, but rather, a policy that applies to the members of a group—in this case, opioid-prescribed individuals.

A3 DOC 3: […] It's just, you know, it's just, it's our policy, and it's a government mandate to do these labs **if you're getting prescribed with narcotics**. It's all for your safety.

The physicians also used pronouns such as "we" and "our" to frame policy enactments as a joint endeavor accomplished through collective efforts. For instance, by saying "we'll" instead of "you'll have to do a urine test" in Line B1, the physician was able to realign their stance to match their patients'. Similarly, by responding to the patient's protest using the pronoun "our" instead of "your" in "[drug testing]'s in our contract, remember?" in Line A5, the physician opens the opportunity for the patient to reconsider their position to match those of the physician's.

The last broadening tool is the physicians' use of modality to introduce optionality and soften what would otherwise be overtly unrestrained and, therefore, potentially face-threatening commands. Brown and Levinson ([1978]1987) discussed physicians' use of *should* and *could* to suggest willingness to negotiate. Part I has shown that modals convey optionality because their permissive and restrictive qualities allow patients and physicians to reevaluate what would otherwise be straightforward statements or directives. Table 4.3 shows a version of the physicians' statements in Excerpts (A) and (B), but without the modals. Instances of inclusive

"we" were also changed to "you," although the second-person pronoun is often omitted if its referent is apparent to all interlocutors.

Table 4.3: Comparing utterances with and without modals

		Physician utterances with modals	Physician utterances without modals
A3	DOC 3:	It [drug test] **should** be really quick	It is really quick
B1	DOC 1:	We**'ll** have to do a urine test.	(You) Do a urine test/ You have to do a urine test
B4	DOC 1:	**Can** you get your lab checked real quick upstairs?	(You) Get your lab checked real quick upstairs

"It is really quick" conveys a higher degree of certainty than "it should be really quick" because the modal *should* provides the patient an opportunity to consider instances in which the test may not be quick. Similarly, the addition of modals in "We'll have to do a urine test" and "Can you get your lab checked real quick?" may be mitigating, but they also suggest that the mandates are negotiable, and, therefore, susceptible to rejection. This specific result expands on the findings from Part I by showing that modality could also serve as a broadening tool in spoken discourses, just as they function in written health policies.

Redirection. The physicians also distanced themselves from the demands of new mandates by redirecting their patient's attention toward the policies themselves, using phrases such as "It's our policy and it's a government mandate," in Line A3, and "It's just routine unfortunately … It's in our contract" in Line A5. Redirecting allows physicians to save positive face by preempting blame while also protecting the patients' negative face by providing them with an alternative entity on which they can take out their frustrations. Redirection has been

found to be a discourse feature that therapists use when responding to blame (Friedlander et al., 2000). The term *redirection* also fits with what Clark and Hudak (2011, p. 386) describe as the act of formulating treatment decisions as if they are "products of impersonal logic involving standard practice or what one tends to do."

It is also worth pointing out that physicians also embellished their redirection with lexical items such as "unfortunately" in Line A5 to convey empathy and solidarity over an unfortunate shared experience. By conveying that they share the patient's view that undergoing routine tests is unfortunate, physicians are able to position themselves closer to patients and farther from policies.

Tag questions. The embedding of interrogatives at the ends of phrasal boundaries—such as "You know?" and "Remember?" in Line A5—is an approval-seeking technique that mitigates the intensity of what was just said.

A5 DOC 3: It's, it's just rules, **you know?** […] In fact […] it's in our contract, **remember?**

Tag questions are known to elicit collaborative thinking at times of tentativeness due to a speaker's lack of confidence and certainty (Lakoff, 1973; Brown & Levinson, [1978]1987). In this case, however, the tentativeness is not due to physicians' lack of policy knowledge, but the face-threatening nature of enacting a policy that patients may dislike or reject.

Downtoners. Physicians used downtoners (i.e., words such as *just, maybe,* and *kind of*) to help explain or make sense of certain policy enactments. Downtoners were a recurring observation whenever the physicians were enacting the policy on drug tests. Excerpt © shows how the physician uses the downtoner "just" to inject a mundane aspect into their mandates and

downplay the significance of routine tests. After Excerpt (C) are more examples of downtoners taken from Excerpts (A) and (B).

(C)

C1	DOC 2:	[laughter] Umm, now and I need you to do some blood work, uh…
C2	PAT 2:	Okay.
C3	DOC 2:	On your way out.
C4	PAT 2:	I will.
C5	DOC 2:	One of them is for Norco; we **just** need to do that, umm, **every so often**.

From (A) and (B)

A1	DOC 3:	[…] my instruction for you today, is that, **maybe** you have time to go upstairs to do **some quick** labs?
A3	DOC 3:	[…] we're **just** talking about it, okay? […] **it should be really quick**, […] It's **just**, you know, it's **just**, it's our policy […]
A5	DOC 3:	It's, It's **just** rules, you know? […] It's **just routine** unfortunately.
B4	DOC 1:	[…] can you get your lab checked **real quick** upstairs?

Quirk et al. (1985) referred to words such as "just" in C5 as downtoners—a specific form of intensifier aimed at decreasing a proposition's intensity and therefore minimizing the significance of a particular FTA (see also Aijmer, 2002; Lee, 1987). In line with this definition, this chapter also considers phrases intended to modify time, such as "every so often" in Line C5, "quick labs" in Line A1, and "real quick" in Lines A3 and B4, as downtoners that minimize the

role of time in lab testing. By specifying that the lab tests are regular and quick, the physicians are able to impress upon their patients that drug tests are mundane, common, and untroubling.

4.4.2 Prescribing anti-overdose medication to all patients taking opioids

The mandate to dispense opioid antagonists to opioid-prescribed patients at high-risk of overdose leads to one of the most awkward exchanges between patients and physicians. Drugs like naloxone, also known by the brand name Narcan, are used to counter the effects of opioid overdose. Although naloxone could benefit opioid-prescribed patients, initiating a discussion on overdose can be face-threatening to both interlocutors, with physicians being forced to risk the relationship they worked hard to establish and patients potentially perceiving the discussion as a declaration of distrust. This section starts with more details on impersonalization, followed by features that have already been discussed but with examples pertinent to the policy mandating the co-prescribing of anti-overdose medication.

***Impersonalization*.** Notably, whenever physicians talked about the risks of opioids to their patients prescribed with them, they actively avoided directly associating their patients to addiction and overdosing. Take the bolded text from Excerpt (D) as an example:

(D)

D1	DOC 1:	Yeah, so, this is u-uh, we also gave you naloxone. This is, uh, this is an injection that you, you take…
D2	PAT 1:	…I got a whole bunch of boxes of that.
D3	DOC 1:	Oh, right. Oh, you do have a bunch.
D4	ATT:	Oh, you do? Okay.
D5	PAT 1:	Yeah… [laughs]
D6	DOC 1:	Basically, you know, if you, if, if a, **if there's concern for overdosing on any**

of the other … where you have suppressed breathing and all that stuff… it's [inaudible] like Norco or even like, you know, other substances like heroin or anything like that, other things that may w—you know? It's still important to have this just in case.

D7 ATT: Yeah, it's just required by the law.

This chapter adopts Rundblad's (2007) description of impersonalization—a rhetoric device used in scientific writing to frame subjects as if they could be anyone else—into the context of face-work in spoken discourse. The notion is often associated with agentless passive constructions (Brown & Levinson, [1978]1987), but, as the findings of this chapter will show, spoken speech does not need to be in passive voice to impersonalize. This chapter also shows that impersonalization, when taken to the context of speech, is different from the agentless passive construction often associated with the process (Brown & Levinson, [1978]1987). In Line D6, DOC 1 talks about overdosing without a definite human agent (i.e., the individual who would overdose) or a clear experiencer (i.e., the individual who would suffer from overdose). Doing so allowed DOC 1 to discuss overdosing without implying that PAT 1 is someone who could overdose, preempting any potential confrontations or disagreements. One way in which DOC 1 employs impersonalization is by avoiding the use of the pronoun *you.* Take, for example, all the instances of "you" in Line D6. Besides mentions of "you" as part of the tag question "you know?", the pronoun only appears in two other instances. The "you" in "if you, if, if a, if there's concern," may have initially positioned PAT 1 as the agent, but the phrase ended with no identifiable agent. Changes intended to alter the meaning or direction of an ongoing speech can be indicative of repairs. In this case, the syllabic repetition of "if, if a, if" acts as the transition device bridging the original uncorrected message "if you" to the corrected message "if there's a concern." Without the repair, the statement would've been "if you have concerns of overdosing."

The fact that the physician felt the need to repair their statement after mentioning "you" is indicative of their effort to prevent making direct associations between the patient and other key words mentioned later that same turn, such as "overdosing" and "heroin."

The physician's next mention of "you" was in "where you have suppressed breathing and all that stuff," which comes shortly after the repair and has no clear identifiable antecedent, making it difficult to tell whether DOC 1 meant to use the singular form to refer specifically to PAT 1 or the plural version to indicate a vague number of subjects. Regardless, the physicians' attempts to disassociate the act of overdosing from PAT 1 remains undeniably evident throughout this one turn and more so in the entire exchange. This example shows just how complex exchanges can be when it comes to policy implementation in healthcare and the hyperawareness required for accomplishing the task. More examples of impersonalization are found in Excerpt (E), represented by the bolded text.

(E)

E1	DOC 3:	So, do you have a question about the naloxone or the Narcan that we're offering to every patient?
E2	COM:	What is that?
E3	DOC 3:	It's a medication, a nasal spray, that reverses an opioid overdose. Uhmm. **It also works for heroin overdoses,** but, you know, again, everyone gets it since we are experiencing an opioid crisis.
E4	PAT 3:	[laughing] I don't [inaudible] any medication [inaudible] as a matter of fact.
E5	DOC 3:	Yeah, yeah, no, I get that. **It's just that no one really plans for an overdose,** you know?
E6	PAT 3:	There's two of them. [inaudible] Is it two different ones?
E7	DOC 3:	No. Uhmm, there's the nasal spray which you said you prefer than the injection one.

E8 PAT 3: Okay.

E9 DOC 3: Uhmm, we're offering it to all our patients that get, um, opioid prescriptions.

E10 PAT 3: Yeah, I'll take it.

E11 DOC 3: Yeah, I mean I just want you to know, it's available.

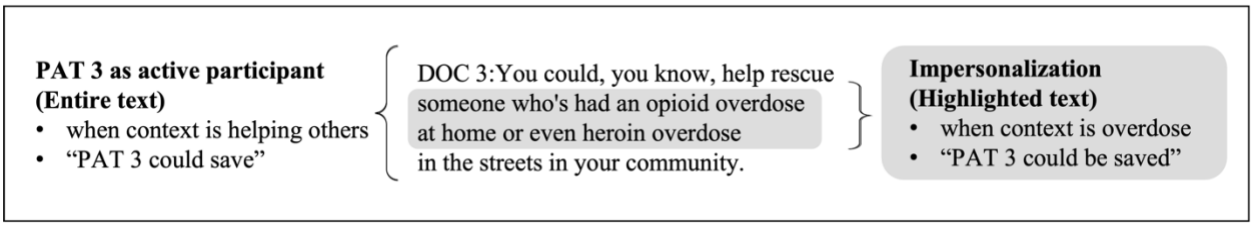
E12 PAT 3: Right.

E13 DOC 3: In fact, what I tell people, you know, is that **you could, you know, help rescue someone who's had an opioid overdose at home or even heroin overdose in the streets in your community,** you never know… I mean… It would be great to just have around, and, again, we give it to everyone prescribed with opioids.

E14 PAT 3: Right. That's what I was gonna say. And I appreciate that. Thank you very much.

In Line E3, DOC 3 could either use PAT 3 or a vague experiencer to relay the same message that Narcan is just as effective in reversing overdoses from heroin as it is with prescription opioids. Given both options, DOC 3 avoided naming the patient as the example for heroin overdose. Other examples of impersonalization would be the use of "no one [really plans for an overdose]" and "someone [who's had an opioid overdose]" in Lines E5 and E13, respectively. Although the examples take on two very different meanings, they both share the function of distancing PAT 3 from the possibility of overdosing. Line E13 is an example in which DOC 3 employs both impersonalization and its opposite (i.e., framing the subject as an active participant). DOC 3 does so by positioning PAT 3 as someone *who could save* throughout the turn and someone *who could be saved* in a segment within that turn, as illustrated in Figure 4.1.

Figure 4.1: Example of selective impersonalization



Note: The entire turn frames PAT 3 as an active participant while the highlighted part, as a unit, is an example of impersonalization.

This seemingly simple yet innately complicated construction uses impersonalization, but only in the context of overdosing and not in helping. This face-saving process allowed DOC 3 to discuss and enact the policy without sounding accusatory toward the patient. The examples presented here are in line with and expands on Caffi's (1999) findings, which, as discussed in Section 4.2.2, list *impersonalization* as one of the mitigating strategies found in doctor-patient transcripts of psychotherapy sessions in Italian.

Broadening. Though this strategy has been covered in the previous section, broadening is equally salient in interactions involving co-prescribing overdose medications. The specific type of broadening observed here is the generalization of target audience. Physicians saved face by repeatedly emphasizing that everyone prescribed opioids also receives naloxone, preempting any possibilities of patients feeling targeted or misjudged. The following excerpts present the attempts physicians made to open the discussion on overdose medication; the text in bold marks broadening:

From (E)

E1 DOC 3: … the naloxone or the Narcan that **we're offering to every patient?**

E2 COM: What is that?

E3 DOC 3: **… everyone gets it** since we are experiencing an opioid crisis.

E4 PAT 3: [laughing] I don't [inaudible] any medication [inaudible] as a matter of fact.

E9 DOC 3: … **we're offering it to all our patients that get, um, opioid prescriptions.**

E13 DOC 3: … It would be great to just have around, **and, again, we give it to everyone prescribed with opioids.**

In Line E1, the physician introduces the idea of naloxone indirectly by asking PAT 3 if they have any questions about the drug as if the patient already knows what it is. The companion's response in Line E2, seeking further information on the drug, signals the lack thereof and provides the physician the opportunity to introduce the overdose medication in Line E3 as a question response instead of volunteered information. The laughter that ensued and the defensive reaction in Line E4—when the patient declared not needing such medication "as a matter of fact"—suggests decisive disagreement. However, the physician saved face through the constant referencing of a broader audience as well as the use of inclusive "we," which clarified that that they are simply following the policy to dispense naloxone to all patients taking opioids.

Redirection, downtoners, and tag questions. As with the policy on drug tests, the mandate on co-prescribing naloxone also prompted physicians to redirect the conversation toward policy to preempt potential disagreements. An example would the attending physician saying "It's just required by the law" in Line D7. Moreover, downtoners such as *just* and tag questions such as *you know?* occurred in the same turns to downplay the act of prescribing naloxone and to elicit patient confirmation, respectively. Additional examples include Lines E5 ("It's *just* that no one really plans for an overdose, *you know*?") and D6 ("Like Norco, or even like, *you know*, other substances like heroin or [...] other things that may w—*you know*?, it's still important to have this *just* in case.")

4.4.3 Weaning patients off opioids and starting alternative treatments for pain

Physicians are also under immense pressure to help chronic pain patients being treated with opioids transition to an alternative (non-narcotic) pain-management regimen. Examples of alternative treatments include non-steroidal anti-inflammatory drugs (e.g., ibuprofen), acupuncture, and procedures (e.g., trigger point injections). Weaning patients off opioids also entails additional testing to narrow down the source of the pain. The enactment of such a policy can be equally face-threatening to physicians, who are required to listen to their patients' protests and to patients who take opioids to better their quality of life or satisfy cravings and avoid withdrawal symptoms.

***Redirection*.** In discussions about opioid tapering, physicians redirected their patients' attentions toward opioid side effects instead. The mention of side effects allows physicians to discuss the lowering of opioid dosage as important for the patients' well-being and, at the same time, fulfill the demands of policies on tapering. The long list of side effects that could be linked to opioids—from constipation to headaches—provides physicians plenty of opportunities to initiate tapering discussions. The bolded text in Excerpt (F) provides an example of a physician's attempt to initiate tapering discussions by citing opioid side effects as the potential source of the patient's recent itchiness.

(F)

F1	DOC 2:	**The one thing I could think of on your list that would make you itchy is your Norco, umm**.
F2	PAT 2:	But I, I was taking Norco though—
F3	DOC 2:	Before, and I know that you were itchy…
F4	PAT 2:	—after.

F5 DOC 2: Yeah, you were itchy before the Norco started, so I don't think that's what it is.

F6 PAT 2: No, I don't think so either, 'cause I was, I mean I-I've been… I, I had the Norco after I started itching.

F7 DOC 2: Yeah, and I just I, I am not sure what it is, because we don't think it's bites, we don't, we don't think it's hives. Uh.

Here, DOC 2 brought up the opioid, Norco, as a potential explanation for the patient's itchiness, which was met with pushback. The physician's attempt to redirect toward side effects was unsuccessful here, as it did not lead to the discussion of tapering opioids. Existing literature on medical communication involving opioids has hinted at the use of redirection in encouraging alternative treatment. For instance, Henry et al.'s (2019a) research recognized situations in which patients present negative evaluations of opioids or make mention of their side effects as promising opportunities for physicians to broach the subject of lowering opioid doses or starting non-opioid treatments. However, the redirection in the example above offers a different approach to diverting conversations because PAT 2 did not present the skin problem as a side effect of opioids; it was the physician who first established the connection between the skin and opioid side effects in an attempt to redirect the conversation toward alternative treatment.

Another way physicians initiated the discussion of tapering is by redirecting patient attention toward the need to find and address the actual source of pain. In Excerpt (G), DOC 1 proposed additional tests to better identify the source of PAT 1's pain; the bolded text corresponds to the physician's redirection attempts.

(G)

G1 DOC 1: Um, and we kind of discussed last time maybe **pursuing an MRI of your low back to see if maybe there might be, uh, some pain related to that low back area and the spine.**

G2 PAT 1: Well, I haven't had nothing done to my…

G3 DOC 1: Yeah, but sometimes if you have bilateral pain in your, in your, in your legs, **sometimes that could be from the, from the nerves in your back.**

G4 PAT 1: But this pain [inaudible] for so long?

G5 DOC 1: Yeah. **Um, I think I also was wondering if maybe, um, you, you might, you might have what we kind of talked about last time, like opiate, opiate use disorder. Basically, your brain gets tolerant to a high dose of opiates, and then, um, in order to control that pain, you, you need more opiates, but it's kind of a downward spiral where, um, your brain gets used to—**

G6 PAT 1: No—

G7 DOC 1: **—to being on more--**

G8 PAT 1: […] No. It's like, it's like this. It's like damned if I do and damned if I don't.

G9 DOC 1: Yeah, yeah, yeah.

The physician's attempt to pursue an MRI in Lines G1 and G3 were met with contention, prompting DOC 1 to redirect PAT 1's attention toward opioid use disorder and to explain that PAT 1's tolerance may be contributing to her current pain levels. Line G5 may also be considered as DOC 1's attempt to redirect toward side effects since, as the physician pointed out, opioid tolerance develops from consuming the narcotic, aptly describing the cycle as "a downward spiral" to belabor this point. The awkward conversation ensues with a defeated response from the patient in Line G8, "It's like damned if I do and damned if I don't." The physician's vague response in Line G9 is indicative of how difficult conversations about drug dependence can be. The physician's use of euphemism through medical terminologies such as

"opiate use disorder" is a face-saving feature that has already been extensively discussed in face-work literature and, thus, is not dealt with in this dissertation.

(Negative) Imagery and Listing. To overcome the face-threatening nature of discussing alternative pain treatments, physicians offered justifications to establish a motivation that could facilitate the policy enactment; the physicians in this study accomplished this by organizing chunks of language into an easily identifiable order, turning them into lists. According to Jefferson (1990), lists are discourse tools that, when used in speech, render convincing messages, as they signal thoroughness, completion, and comprehensiveness. Jefferson (1990) introduced the idea of "three-part lists" after observing that lists often contained three singular entities. Dori-Hacohen (2020, p. 307) expands on this idea and introduces "long lists"—lists can take on more than three entities and perform the same functions as three-part lists, making a speaker sound compelling.

The physicians also incorporated medical terminologies that paint undesirable images, such as "overdosing," "risks," and "death." These images are often found within lists and contribute to the meanings patients make out of physician suggestions. Excerpt (H) continues where Excerpt (G) left off. The exchange starts with PAT 1 making a case for continuing her current opioid dosage and DOC 1 justifying alternative treatments through listing and negative imagery, represented by the bolded and underlined text, respectively.

(H)

H1 PAT 1: Um, I just want something for I can get up and be on my legs. And that's all I'm asking. I'm not asking for a lot. But, you know what? I might be scared that you might discontinue them [Norco], but I want to be able to walk. That's the only thing.

H2 DOC 1: Right. So, I have a few options, okay? So, **number one,** um, with— with chronic pain and being on opiates, we really want to know, like, why you're having the pain. Okay? If we don't fix the root cause, then, you know, you're going to be on pain meds for the rest of your life. **That's one thing.**

H3 PAT 1: Mhm.

H4 DOC 1: **The second thing is,** um, we want to also make sure that you're safe. Okay? So, being on these opiates can make you **tired, groggy; it could also suppress your breathing,** right? And— you can come to the hospital cause you— some people can get, um, **overdose on the opiates**. It could be a big problem and even being on a certain amount of opiates, there's a **risk of sudden death** as well, which have been shown in multiple studies Um, so **one thing** that I would like to do is make sure we control your pain with the right medications, but not, not have you be **sedated, groggy, and also have that risk for sudden death, right?** I mean that's a scary thing.

H5 DOC 1: So, one of the medications that we kind of talked about last time was this buprenorphine, okay? It doesn't really suppress **your respiratory drive, your breathing, but it has a good effect on pain control**. There's a lower risk of sudden death, okay? But they get the same amount of, um, pain control. Okay?

H6 DOC 1: Is that something that you might be interested in, in converting to? buprenorphine? And see if maybe that might be, uh, good for you in terms of pain and then also, reduce your risk of, of, you know? Of **sudden death** as well.

H7 PAT 1: Um, yeah, we can do that… next month.

This complex exchange starts with PAT 1 implying to only want one "thing" with the help of some quantifying terms—"that's *all* I'm asking," "not asking for *a lot*," and "that's the *only* thing"—to belabor its importance. That said, PAT 1 used the verb "want" twice in a single turn to refer to two different desires: (1) opioids that "can" help her get up and (2) to be "able" to walk. The combination of the verb "want" and words denoting ability, such as "can" and "able," suggest that PAT 1 is associating opioids with her capacity to walk, leaving the physician with the difficult job of suggesting non-opioid treatment without seeming to deprive the patient their ability to walk.

To address PAT 1's concerns, DOC 1 presents their arguments in the form of a list. Excerpt (H) includes an overarching or higher-ordered list separated by speaking turns, within which are lower-ordered lists that are characteristically similar to written lists because they use separators such as pauses (commas) and connectors conjunctions such as "and." In the higher-ordered list, DOC 1 mirrors PAT 1's use of numeric terms and uses them to denote plurality by either (1) specifying that the entity is not singular, like in "few (options)," or (2) presenting the entities in the form of sequence: "number one," "that's one thing," "the second thing." DOC 1's use of numeric references highlights plurality, which seems to help maximize the weight of their response. In this particular case, DOC 1 made the decision that the appropriate response to convince PAT 1 requires more than one reason; otherwise, DOC 1 would have ended their justification after the first point they made in Line H2.

The lower-ordered lists found within turns add specificity to descriptions or emphasis to what is being said. For instance, opioid side effects—tiredness, grogginess, suppressed breathing, sudden death—and the benefits of buprenorphine—boosted respiratory drive, better breathing, good pain control, less chances of sudden death—were sublists included under DOC 1's second main point. Whether or not these lists are accurate, the physician is providing what appears to be a well-thought-out response in comparison to the alternatives (i.e., short, simple, and singular). By naming several side effects or citing multiple reasons to seek non-opioid alternatives, the physician is able to convey a sense of thoroughness. As Jefferson (1990) pointed out, lists allow speakers to evoke a sense of credibility. Thus, lists allow physicians to save face through the organization and demonstration of knowledge within a sequence.

The physician's word choices can also contribute to or trigger certain images and emotions that could motivate patients to wean off opioids or to become open to finding

alternative treatment. These lexical choices form what Tannen (2007) refers to as *imagery*, a discourse tool that creates involvement and shapes imagination. For example, DOC 1 used medical jargon to refer to the side effects listed, as well as phrases such as "big problem," "right medication," "scary thing," "shown in multiple studies," "make sure you're safe*"* that, altogether, contribute to the larger picture being painted by the physician.

Downtoners, broadening, and tag questions. The physicians used downtoners such as "kind of," "some," "sometimes," "maybe", and the conditional "if" to mitigate the semantic weight that comes with discussions about reducing opioids. Just as in previous examples, modals and the inclusive "we" were also employed in discussions of alternative treatment as a broadening tool, while tag questions like "You know?," "Right?," and "Okay?" were used to seek confirmation. Here are phrases compiled from Excerpts (G) and (H) with the bolded text indicating the downtoners, broadening, and tag questions: "**We kind of** discussed last time **maybe** pursuing an MRI to see **if maybe** there **might** be **some** pain related to that low back area and the spine. **We** really want to know why you're having the pain. **Okay?** If **we** don't fix the root cause, then, **you know…"**

Impersonalization. Instances of impersonalization were also observed—especially when physicians listed opioid side effects to encourage patients to try alternative pain treatment. An example would be the statement "you can come to the hospital 'cause you, some people can get, um, overdose on the opiates" in Line H4 where the physician initially uttered the pronoun *you* before engaging in a repair by inserting the phrase "some people." A good way to test the role of impersonalization in the phrase is by comparing it to the alternative. Without the repair, the physician would have said "you can come to the hospital 'cause you can overdose on opiates."

The complex communicative practices shown in this section serve as a preview to the types of conversations and questioning in which physicians are now engaging as more restrictive opioid policies prompt prescribers to be more vigilant about prescribing.

4.5. Discussion

This chapter investigates the face-saving features used by physicians while enacting strict opioid policies. The question is motivated by the physician's dilemma that simply enacting policies can be perceived by patients as distrusting, shaming, and suspecting of their pain. Through discourse analysis, the observed communicative practices unveiled physicians' constant negotiations between maintaining collaborative relationships and policy demands. Table 4.4 provides a summary of the face-saving features physicians employed and the potential role each feature plays in opioid discourse.

Table 4.4: Summary of face-saving acts

Face-saving act	Description	Function in opioid discourse
Pseudo requests (Benkendorf et al., 2001)	Imperatives and mandates disguised as suggestions, questions, or requests.	To frame treatment decisions as collaborative.
Downtoners (Quirk et al., 1985)	Lexical items or phrases that decrease the intensity of the message, such as *just*, *maybe*, or *kind of*.	To mitigate potential consequences and avoids causing panic and distress.
Impersonalization (Rundblad, 2007)	The use of an ambiguous reference to describe an outcome or action supposedly for the listener, as if they were someone else.	To discuss fraught issues such as overdoses and dependence without referring to the patient.
Broadening (Audience) (Brown & Levinson, [1978]1987)	The justification that the listener is subject to certain mandates because of their group membership, rather than a malicious, targeted, or isolated event.	To signal authority and credibility for the decisions and suggestions that affect the patient.

Broadening (Scope) (Brown & Levinson, [1978]1987)	Use of inclusive words such as *we* and *our* that frame both the speaker and the listener as a unit or members of one.	To minimize one's involvement to an event or decision and signal collaborative decision-making or agreement toward a proposition.
Broadening (Interpretation) (Torres, 2021; see also Chapter 3)	Use of modal verbs, such as *may* or *would,* to broaden the interpretive spaces of propositions.	To introduce some sense of optionality mitigating the intensity of a command.
Tag questions (Lakoff, 1973)	Confirmation questions, such as *Okay?* and *You know?*, found between phrasal boundaries.	To seek approval and confirmation, signal collaborative thinking, check for supposedly recognizable information, and maintain alignment.
Listing (Dori-Hacohen, 2020; Jefferson, 1990)	Phrases in which information is organized in a particular order or presented like a sequence.	To suggest credibility when justifying imperatives or mandates emerging from policies. To portray a comprehensive or thorough understanding of a topic.
Redirection (Friedlander et al., 2000)	Phrases that deflect or divert the ongoing conversations toward an alternative path, such as (1) pivoting discussions about pain toward a conversation about the source of pain or (2) referencing policies to justify certain decisions.	(1) To frame pain as an entity that originates from a particular source and therefore treatable or (2) to minimize responsibility or involvement from certain mandates and actions
(Negative) Imagery (Tannen, 2007)	Shaping the ways in which hearers imagine and make meaning out of images.	To further justify policy enactments and add convincing power to treatment suggestions.

Note: Collectively, these features share the common purpose of maintaining collaborative relationships and preempt arguments or disagreements.

In addition to the primary results, this chapter also expands on existing literature focusing on discourse features, face-work, and doctor-patient interactions, adding observations such as:

1. Lists indicate plurality, which makes listing a suitable discourse feature for communicating legitimacy, adding a sense of fullness or highlighting the multitude

of what is being said. Spoken lists further benefit from the use of sequencing verbiage such as “number one” and “the second thing is.”

2. In line with Quirk et al.’s (1985) definition of downtoners as expressions that downplay FTAs, phrases such as “every so often” and “real quick” are downtoners, by function, because they minimize the time consumed by drug tests.
3. Highly technical and unexplained scientific language or medical jargon can contribute to (negative) imagery.
4. Just like in written health policies (Torres, 2021), modals can also function as a broadening tool in spoken interactions, particularly in health policy enactments.
5. Impersonalization, a process that has been previously documented in written health discourses (Rundbland, 2007), is just as salient in verbal medical exchanges.
6. Impersonalization, a process commonly associated with passive construction in written text, emerges in myriad other ways—from repairs to wordplay—in spoken interactions.

4.6 Summary

This chapter focused on physicians’ discursive features as they enacted increasingly restrictive opioid policies that could upset chronic pain patients. Through discourse analysis, the chapter detailed eight different face-saving strategies used by physicians as they implemented opioid policies. Part II calls attention to the challenging nature of having to implement policies that restrict patients from opioids while also maintaining the collaborative relationships that many studies believe could help convince patients to try alternative treatment.

5 Part III: Patients

5.1 Introduction

This chapter, which is the last of this three-part exploration, examines the use of language features by WCMC patients during consultations. As has been noted, Part III pays particular attention to the voice quality of patients because physicians prescribe opioids based on how patients talk about their pain and symptoms more so than they rely on the severity and the duration of pain (Turk & Okifuji, 1997; Heath, 2002). Thus, Part III answers the following research question: *What context-specific voice qualities or articulatory choices were used by chronic pain patients to express pain and request opioids?* Informed by interactional sociolinguistics and sociophonetics, this chapter forms a bridge between policies and local interactions through prosodic discourse analysis (Chafe, 1993), outlining the voice features used by patients to index pain and their need for strong medications addressing such pain. This chapter shows that patients use both low pitch and creaky voice to describe their pain and request opioids. The videos analyzed in this chapter were collected with funding from the National Institutes of Health (Grants KL2TR000134 and UL1TR000002) and the University of California, Davis Department of Internal Medicine.

The current opioid crisis heightens the relevance of investigations focusing on verbal manifestations of pain. For instance, Merrill et al. (2002) revealed fear and mistrust as dominant themes in consultations involving opioids. In fact, both patients and physicians have reported discussions about opioids and chronic pain to be challenging and frustrating (Henry et al., 2016). Roberts and Kramer (2014) expressed the need for analyzing linguistic practices in medical appointments where pain medications are discussed, as issues related to controlled substances are

fraught with ethical and moral questions, as well as the potential for abuse or the fabrication of symptoms to justify drug-seeking behavior. Matthias et al. (2013) echo this point, calling for more direct explorations into obtaining a better understanding of pain management communication. This chapter meets such need by offering a phonetic perspective of how patients discuss chronic pain and opioids during a time of crisis. This chapter also broadens the applicability of acoustic or prosodic analysis, which has mostly been used in the clinical setting to address pathological speech issues (Cernak et al., 2017; Dudy et al., 2018). Lastly, this study contributes a medical and policy perspective into the growing domain of research about intraspeaker voice-quality variation and the role linguistic choices play in shaping identity and creating social meaning (Mendoza-Denton, 2011; Podesva, 2007; Wilce, 1997).

The following section (Section 5.2) contextualizes this study further by providing background information on voice quality and by highlighting key literature on spoken discourse. Section 5.3 lays out the methodological dimensions of the study, while Section 5.4 outlines the findings. Section 5.5 synthesizes the results. Finally, Section 5.6 concludes with a brief summary.

5.2 Related Literature

5.2.1 Voice quality: Modal versus creak

Voice quality, as it is used here, refers to the type of phonation speakers produce in the larynx. Modal phonation is the voice quality resulting from the neutral or typical form of speaking, when speakers articulate within their natural pitch range. In contrast, non-modal phonation is the product of speaking beyond one's usual range (Gerratt & Kreiman, 2001). A speaker, at will, can strategically assume different modal voice qualities—like high or low pitch

and non-modal phonations such as whisper, falsetto, breathiness, and creak to portray certain attitudes and emotions (Couper-Kuhlen, 2015; Esling, 2012).

The everyday use of the word *pitch* describes the degree of highness or lowness of a tone. Linguistically, pitch is the perception of the rate of vocal fold vibration (Berry, 2001). It is when speakers target a remarkably low pitch that they produce irregularly spaced vocal pulses known as creaky voice or vocal fry. Thus, creak and—to a certain degree—low pitch,[5] are both products of epilaryngeal constriction—a process of the lower vocal tract that results in the shortening, bunching, and adduction of the vocal folds, leading to lower pitch frequencies and, consequently, the shifting from modal to non-modal phonations like creak[6] (Esling et al., 2019).

5.2.2 Interpreting the use of pitch in discourse

The introduction of contextualization cues—fully interpretable and indexical linguistic signs that possess an embedded context—in the 1970s resulted in investigations linking linguistic styles to social meaning (Gumperz, 1982; see also Van Dijk, 2011). Later research, including that of Tannen and Wallat (1987, p. 208), provided evidence that identifiable linguistic cues such as register—prosodic choices deemed appropriate for the setting and audience—could inform medical discourse. A speaker's register is often described in terms of intonation, the variations in pitch often used in English to express the purpose of utterances as well as to understand the

[5] While epilaryngeal constriction passively lowers pitch, it does not necessarily constitute active pitch lowering. As Moisik (2013) puts it, the constriction synergizes with low pitch.

[6] It is important to note that epilaryngeal constriction could result in different types of non-modal phonation, including varying degrees of creak like "harsh" and "pure" (Moisik, 2013). In the present study, the term *creak* is used in this dissertation as a collective term referring to its many variants.

attitudes and emotions of other speakers (Couper-Kuhlen, 2015). For example, the use of rising and falling intonation usually helps us understand the difference between statements and questions, among many other ways of regulating discourse.

Earlier studies on pitch and intonation elicited the help of actors to portray emotions because of the idea that neutral speech must also be gathered as a baseline for comparison. Using this method, Zetterholm (1998), as well as Bänziger and Scherer (2005), found that both pitch lowering and creak portray sadness. The design of this chapter's study is informed by Cruttenden's (1997) work on intonation, which highlights the idea that a speaker's register is "marked" when the entire pitch configuration of an utterance is transposed toward the higher or lower limits of their vocal range. Specifically, I illustrate "markedness" by using the speaker's average pitch as a baseline to assess instances in which their pitch deviates significantly from what is typical. This method allows for the examination of linguistic style and the information that actual spontaneous speech carries without the need of actors or neutral speech stimuli.

5.2.3 Interpreting the use of creak in discourse

Creak is one particular stylistic feature used in creating social meaning that has sparked interest among applied sociolinguists and discourse analysts. Scholars have studied the relationship between the use of creaky voice and social class (Esling, 1978), gender and sexuality (Henton, 1986; Zimman, 2012, 2013), authority (Ward, 2006) and stance (Lefkowitz & Sicoli, 2007). According to Anderson et al. (2014), the use of creaky voice is becoming increasingly common among young American women and listeners consider the use of creak untrustworthy and a sign of being less educated. There are, however, several studies showing that young

women's use of creak is perceived as an indicator of the speaker being dominant and authoritative without being aggressive (Borkowska & Pawlowski, 2011; Yuasa, 2010).

While most studies on creaky voice have focused on the linguistic attitudes directed toward young women, there are a few that have examined the contextual application of creak in discourse. More importantly, these studies have looked at the use of voice quality from an intraspeaker perspective—i.e., how an individual employs specific phonation styles in particular discourse contexts—as opposed to the essentializing nature of interspeaker research. Podesva (2007) is among the pioneers in exploring the situational use of creak by taking context, topic, and audience into account; Podesva demonstrated how a speaker from Long Island named Heath manipulates pitch and strategically employs creak to construct a "diva persona." Similarly, Mendoza-Denton (2011) analyzed the narratives of a Californian teenage girl named Babygirl and suggested that creak is a discourse-dependent variable employed in the construction of, in this instance, a Chicana "hard-of-heart" (hardcore) identity. This chapter addresses the lack of similar research in the realm of medical discourse.

Although creak has been generally understudied in the domain of doctor-patient interactions, there is a key study that provides valuable insight for the present analysis. Notably, Wilce (1997) wrote about the use of creak by Bangladeshi patients to signal weakness, low energy, and misery when interacting with biomedical doctors, herbalists, exorcists, and diviners. Wilce points out that the "markedness" or saliency of creak brings attention to the utterance and lends credibility to the speakers' references to their own pain, therefore making vocal fry a learned and internalized social sign that carries particular discourse functions. Similarly, this study pays attention to "marked" speaking turns, in which the speaker's use of creak and low pitch are perceptually prominent.

5.3 Methodology

Using prosodic discourse analysis, this chapter narrows down the different vocal features employed by two patients as they discuss opioids and chronic pain issues with their physicians.

5.3.1 Participants

Just like the participants in Part II, the two patients whose speech are analyzed in this chapter were recruited from WCMC. Both patients take opioids for chronic pain. To account for individual sociolinguistic backgrounds, it is important to note that the two patients and their respective physicians all self-identified as females with American English as their native and preferred language. Interlocutor information is presented in Table 5.1.

Table 5.1: Patient-physician information taken from their pre-consultation questionnaire

Patient			Resident Physician		
Pseudonym	Gender	Age Range	Pseudonym	Gender	Age Range
PAT D	Female	Late 50s	DOC D	Female	Mid 20s
PAT E	Female	Mid 40s	DOC E	Female	Early 30s

The primary purpose of PAT D's visit was to request a refill for her opioid prescription after being denied by a different physician due to recent revelations that another pain clinic was already prescribing her with opioids, among other reasons. The physician's attempt to steer PAT D toward alternative means of pain management was met with resistance. On the other hand, PAT E's reason for scheduling a consultation was to switch to a different type of opioid.

Just like in the previous chapter, the choice to focus on a small number of participants allows introductory investigations like this one to provide a thorough and replicable synthesis of the discourse features in question (Schilling-Estes, 1998). Echoing Podesva's (2007, p. 498)

perspective on voice quality being a vehicle for social meaning, examining the context-specific use of linguistic variables lends insight into speakers' intentions and the functionality of their utterances. In this case, analyzing the patterns in which patients employ creak and low pitch informs us about their understandings of the discourse functions both variables serve in the medical space.

5.3.2 Data handling

To adequately and consistently quantify pitch, the data was organized into speaking turns—the entire speech of a specific speaker before another interlocutor mediates and converses—which is the same convention used in Chapter 4. In the following sequence, because of PAT D's sudden pause, the physician is able to inject a quick backchannel response. As much as PAT D's second turn is a continuation of the first, we consider them as two separate turns.

1	PAT D:	But he wanted me to quit immediately, just like that.
2	DOC D:	Yeah.
3	PAT D:	And I told him, "I can't do that. You can't just quit... methadone like that."

It is important to note that overtalks—situations in which more than one speaker is talking at once—were excluded from the analysis since they do not provide for accurate pitch analysis. Brief backchannel responses such as "uh-huh," "okay," and "right," were not considered as well.

5.3.3 Acoustic analysis

As discussed earlier, although *pitch* is the term regularly used in describing a listener's judgment of what they hear, it also refers to the perception of the rate of vocal cord vibration in Hertz (cycles per second). In other words, pitch is the subjective attribute of the voice's

fundamental frequency (f0) estimate (Bendor & Wang, 2005). Though certain distinctions exist between pitch and fundamental frequency (f0), their relationship is established enough to allow the discussion of pitch through f0 measurements (see Gerhard, 2003). Using f0 measurements to discuss pitch also enables auditory judgments to be discussed in a quantitative manner. In this study, pitch or f0 values were extracted using the pitch-detection function in Praat® software (Boersma & Weenik, 2013). Background noise was removed using Audacity® software (Version 2.1.2, freeware, ©1999-2014. Audacity Team. http://audacity.sourceforge.net) through spectral noise gating—a process that works well when the signal in the recording is much louder than the noise.[7] Pitch values of modal utterances are reported in two scales, as explained below.

Assessing modal utterances

1. Average pitch values: The average or the mean pitch on a linear scale is an adequate system for studies simply aimed at identifying whether a speaker's pitch has changed or remained the same. Thus, this approach is sufficient for showing intraspeaker variation (Speaks, 2007, p. 105). The average pitch of the entire consultation acts as the baseline or point of reference against which marked turns or utterances were identified.
2. Semitones: Pitch measurement represented using a logarithmic scale that has been found to be a closer approximation to human perception of pitch variation (De Looze

[7] Using a Fourier analysis of the first few seconds of the recording, Audacity creates a noise profile used in filtering out the rest of the recording. Both audio files were filtered using the following settings: a noise reduction of 12 decibels with a sensitivity parameter of 3 and frequency smoothing bands set at 0. Audacity can also generate the "noise residue" (i.e., the noise to be filtered out), which was useful in verifying that the audio was not compromised.

& Hirst, 2014; Eyben et al., 2015; Nolan, 2003). Semitones account for speaker-based variations such as age and gender, allowing investigations on pitch similarities and differences across speakers (Torreira & Grice, 2018). Semitones were gathered using a reference value of 100 Hz[8] and the median of the entire consultation acting as the baseline. Semitone values were normalized by calculating the distance between individual semitone values against said baseline.

The initial intraspeaker findings will be reported using average pitch values, while the interspeaker results will be presented in semitones. Reporting pitch values using semitones will also test whether the initial findings from each speaker will remain consistent if integrated into a logarithmic scale. Although extracting average pitch values has been a common element of prosody research designs, some more recent work has been part of an emerging trend that uses average pitch values to characterize emotions and speech acts such as politeness (Caballero et al., 2018), confidence (Jiang & Pell, 2017), passion, and indifference (Truesdale & Pell, 2018). Meanwhile, semitones have long been used to present interspeaker variability and bridge prosody with interactions, including Ogden's (2006) work on the prosody of agreements and disagreements and Ward's (2019) collection of prosodic patterns in English—to name a couple of the many examples.

[8] Boersma noted that, regardless of choosing either 1 Hz or 100 Hz as a reference value, it does not affect the distance between the semitones in question, which is the value that matters when pointing out register shifts. It is, however, important that the reference value remain consistent throughout the study (https://narkive.com/08oe59ms).

The decision to represent pitch through f0 frequency (either through average pitch or semitones) instead of manually marking perception is defensible because gathering acoustic data can easily be replicated in the medical setting. For instance, if pitch were to be added to patients' medical notes in order to track how they speak in certain contexts, it would be viable to use technology to report acoustic f0 data than to manually note impressionistic data.

Assessing creak

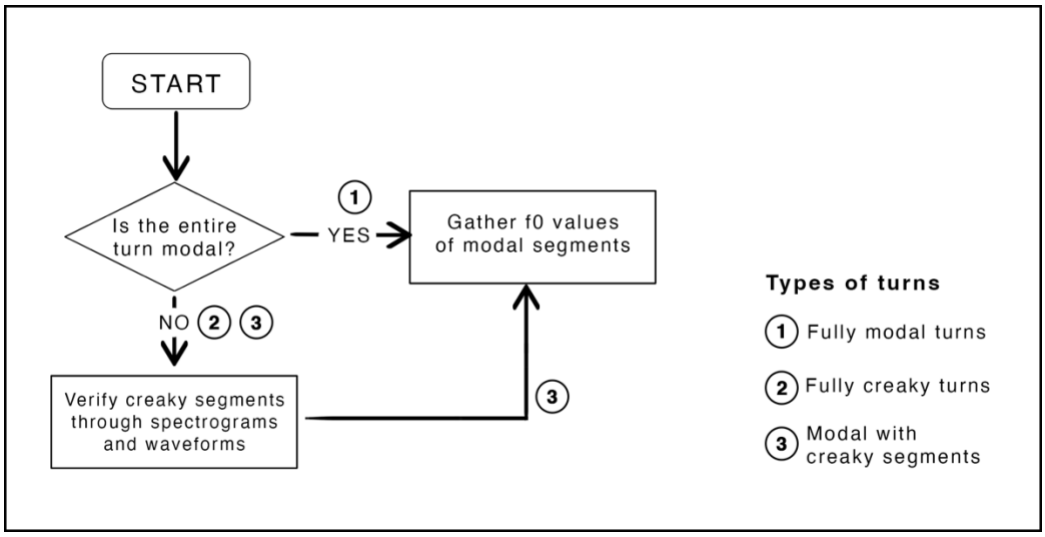
Unlike modal utterances, we cannot simply generate accurate pitch values for creak since its f0 is extremely low and the spacing between the pulses is too irregular (Keating et al., 2015). Thus, creaky voice was distinguished from modal voice through perceptual identification followed by examining waveforms and spectrograms to guarantee accuracy. The acoustic analysis in determining creakiness employs the same criteria used by Henton (1986), Gordon and Ladefoged (2001), Podesva (2007), and Mendoza-Denton (2011). Creak is acoustically exemplified by one or more of the following: (1) the irregular spacing of the glottal pulses in wideband spectrographic displays, (2) inconsistencies in f0 values due to the slowing of vocal fold vibrations, (3) the abrupt decline in f0, (4) irregularity in the period of each cycle (pitch perturbation or jitter), (5) irregularity in the amplitude of each cycle (amplitude perturbation or shimmer), (6) decreased acoustic intensity relative to modal phonation, and (7) fewer pitch periods per second relative to modal counterpart.

For speaking turns that have both modal and creaky segments, only the modal segments were tracked for pitch. Table 5.2 breaks down the distribution of turns while Figure 5.1 outlines the analytic process under which the qualifying turns were subjected.

Table 5.2: Distribution of speaking turns collected and analyzed

Speaking turn	PAT D	PAT E
Number of modal turns (analyzed for pitch)	166	136
Number of entirely creaky (not analyzed for pitch)	17	41
Total	183	177

Figure 5.1: Diagram showing how the data were analyzed acoustically



5.3.4 Coding: Pain-related vs. non-pain-related

To point out the linguistic features both patients use to discuss opioids in light of the current crisis, each speaking turn was coded into different contextual categories using a modified version of the Chronic Pain Coding System (CPCS) developed by Henry et al. (2016). CPCS focuses on the objective characterization of utterances involving pain and opioids, making it appropriate for the current study. The complete coding manual, with definitions and examples for each of the categories or codes used in this chapter, can be found in Appendix E. There are three main contextual categories describing the exchanges between doctors and patients that emerged from the data: (1) discussions about chronic pain and the opioid medication used to

manage it (Table 5.3), (2) discussions about other types of pain that do not involve opioids (Table 5.4), and (3) discussions that are not about pain at all (Table 5.5). The following tables present the various subcategories under each of the three primary categories mentioned, together with sample excerpts from both patients.

Table 5.3: Discussions about chronic pain and opioids

	PAT D	PAT E
Request for opioids	If you could give me methadone pills, I would be happy with that.	I just feel like it [Dilaudid] should be put on there [Pain Contract].
Narration/description of chronic pain (treated with opioids)	I woke up crying last night. I— it's just still all up here in the shoulder.	I've been miserable the last couple days from my neck and shoulders.
Positive assessment of opioid treatment	I know what is safe for me. I've been prescribed with Norco, and it has been working. I'm still alive.	I haven't been needing Zofran as much since they switched me to that Dilaudid.
Negative assessment of opioid treatment	None	None
Ambiguous assessment of opioid	None	(On effectiveness of opioid) It depends on the day, it depends on what I'm doing.
Opioid-related red flags and threats.	I'll self-medicate if I have to. I'll go on the streets. I'm not gonna go through withdrawals.	I probably take more (opioid) overall than I would normally when I'm in a lot of pain.

Table 5.4: Discussions about other types of pain and medication

	PAT D	PAT E
Request for non-opioid medication	I think I need a refill on Dulcolax.	The Robaxin. Um, could you guys change that to 120 tablets a month?
Unclear requests	So, are you gonna prescribe me anything?	None
Request for information	How many refills do I have on the ibuprofen?	Would it be okay if my daughter picks the prescription up?
Positive assessment of non-opioid treatment	None	Neurontin does help with some of the, um, like my skin or my hair hurting.
Negative assessment of non-opioid treatment	Ibuprofen is not good for my stomach.	I've tried it all. I've tried a party bag of ice until I can't even feel it anymore.
Ambiguous assessments of non-opioid treatment	None	Robaxin doesn't really help, but it does.
General agreements	None	Yes. It was just like what I call "stacked." You know, like layer of, a layer of rash.
General disagreements	No, I'm not gonna do Tylenol, because it's not good.	None
Other pain-related utterances	I've had constipation.	I'm kinda worried about asthma.

Table 5.5: Discussions unrelated to pain

	PAT D	PAT E
Non-pain	We can do Rite-Aid, yeah.	Honestly, it's just to go to Taco Bell—

Three coders coded for the categories, including a physician and two sociolinguists trained in discourse analysis of medical interactions. The odd number of coders allows for a

majority rule in cases of disagreements.[9] The Fleiss (1971) interrater reliability is 0.915, which indicates almost perfect agreement.

5.4 Results

5.4.1 Prosodic/Acoustic analysis

Table 5.6 shows Patients D and E's individual average pitch as well as the mean pitch for the three major categories. At this point, we only look at each patient's pitch relative to their own pitch values from other contexts.

Table 5.6: Average pitch of all modal speaking turns per category

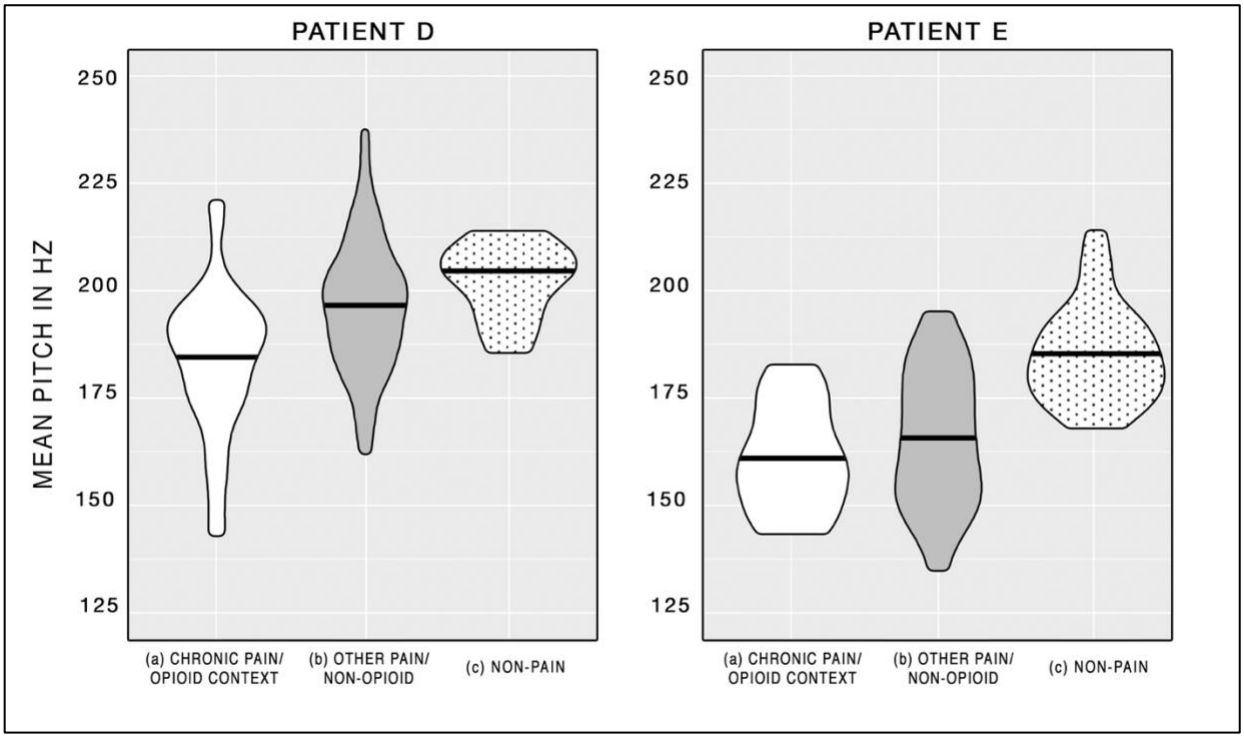
	PAT D	PAT E
Overall average pitch	195.298 Hz	171.108 Hz
All pain-related utterances	194.868 Hz	165.816 Hz
(a) Chronic pain (Opioid context)	184.919 Hz	161.017 Hz
(b) Other Pain (Non-opioid context)	197.316 Hz	166.968 Hz
Non-pain	202.791 Hz	182.552 Hz

Both patients spoke with lowered pitch in utterances that focused on pain; this was even more true when the pain-related discussion involved opioids (including requests and positive assessments of opioids, as well as description of pain in relation to the prescribed opioid). The following diagrams provide a visual representation of each patients' vocal range and the

[9] In the rare case where all three coders selected distinct codes, each made a case for their decision until an agreement was reached.

frequency at which each speaking turn's average pitch occurs. As in Table 5.6, the intent of Figure 5.2 is to show Patients D & E's pitch values in different contexts.

Figure 5.2: Mean pitch distributions for each of the three coding categories



Note: The width of each violin plot indicates the distribution of the mean pitch located at that point, while the bar shows the overall average for that category.

As shown in Figure 5.2, the speakers' pitch in turns concerning pain and opiates were lower. PAT D's pain-related utterances that were not about opioids include speaking turns that are distributed toward the upper registers of her speaking voice. Toward the second half of her visit, PAT D repeatedly raised her voice and over-enunciated some words for emphasis. Although pitch is not synonymous with volume, PAT D's pitch went up as she intensely argued. Nonetheless, it is in the context of pain and opioids in which she speaks in the lower range of her register. On the other hand, PAT E's use of low pitch is clearer. Table 5.7 below provides a

stratified list of results, specifying the average pitch for each subcategory (see Appendix F for the complete breakdown of pitch measurements).

Table 5.7: Average pitch (in Hz) for each subcategory

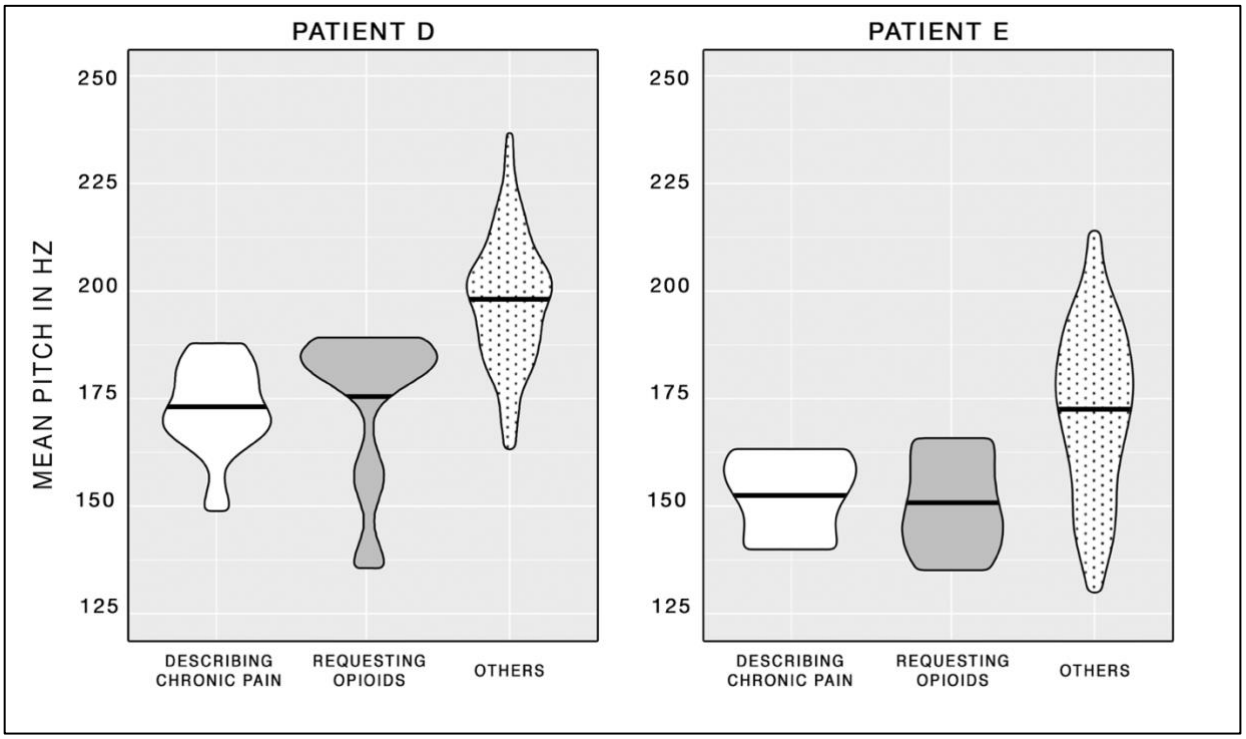
	Average Pitch (in Hz)	
	PAT D	PAT E
Baseline: Overall average pitch	**195.298**	**171.108**
(a) Chronic pain (Opioid context)		
Request for opioids	175.372*	150.993*
Narration/description of chronic pain	173.256*	152.509*
Positive assessment of opioids	200.242	175.799
Negative assessment of opioids	--	--
Ambiguous assessment of opioids	--	175.629
Opioid-related red flags and threats	202.320	151.908*
(b) Other pain (Non-opioid context)		
Request for non-opioid medication	--	167.327*
Unclear requests	208.608	--
Requests for information	195.632	184.222
Positive assessment of non-opioid treatment	--	154.733*
Negative assessment of non-opioid treatment	198.157	180.428
Ambiguous assessment of non-opioid treatment	--	180.394
General agreements	--	164.302*
General disagreements	201.412	--
Other pain-related utterances	196.490	164.747*
(c) Non-pain	202.791	182.552

Note: Asterisk (*) indicates that the average pitch of that category is lower than the speaker's overall average pitch.

As shown in the table, if the initial three categories were to be narrowed down into more specific contexts, the results show both patients tapping into the lower ends of their range as they

narrate or describe their chronic pain or request opioid medications to alleviate it. Figure 5.3 illustrates mean pitch distributions for both patients if the contexts of requests for opioids and description/narration of chronic pain were to be separated.

Figure 5.3: Mean pitch distributions specifically for opioid requests and pain narration

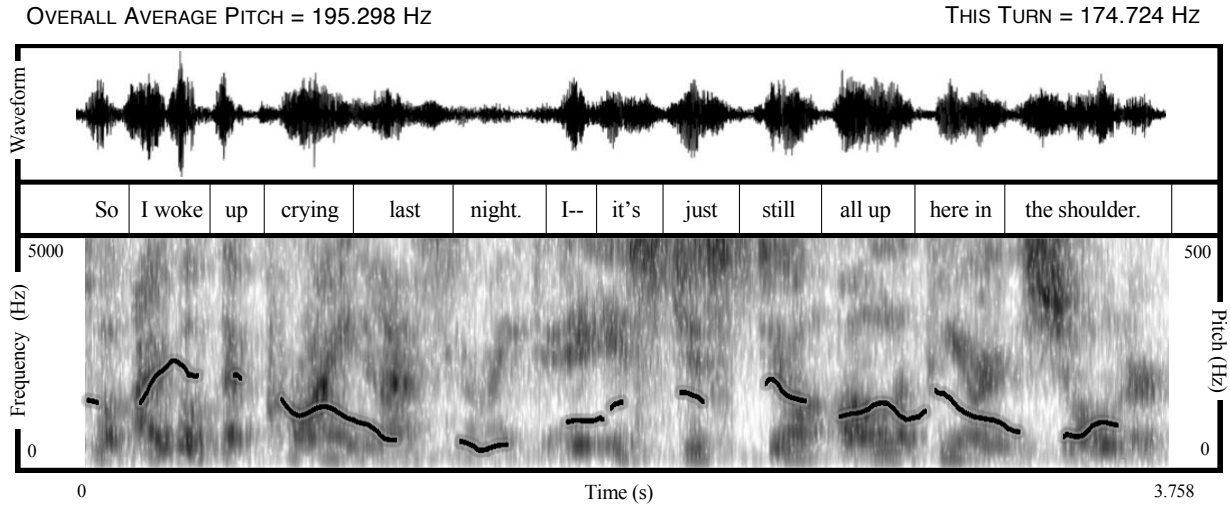


Note: Mean pitch distributions of opioid requests and pain narration separated from the rest of the speaking turns. The width of each violin plot represents the pitch distribution located at that point, while the bar represents the average pitch for that category.

It is important to note that the lowering of both patients' pitch is not limited to the concluding segments of their speaking turns (where it is likely to be expected). Low pitch also occurs in other parts of the turn and is mostly sustained once initiated. Moreover, there is no correlation between the length of a turn and the potential for pitch lowering.

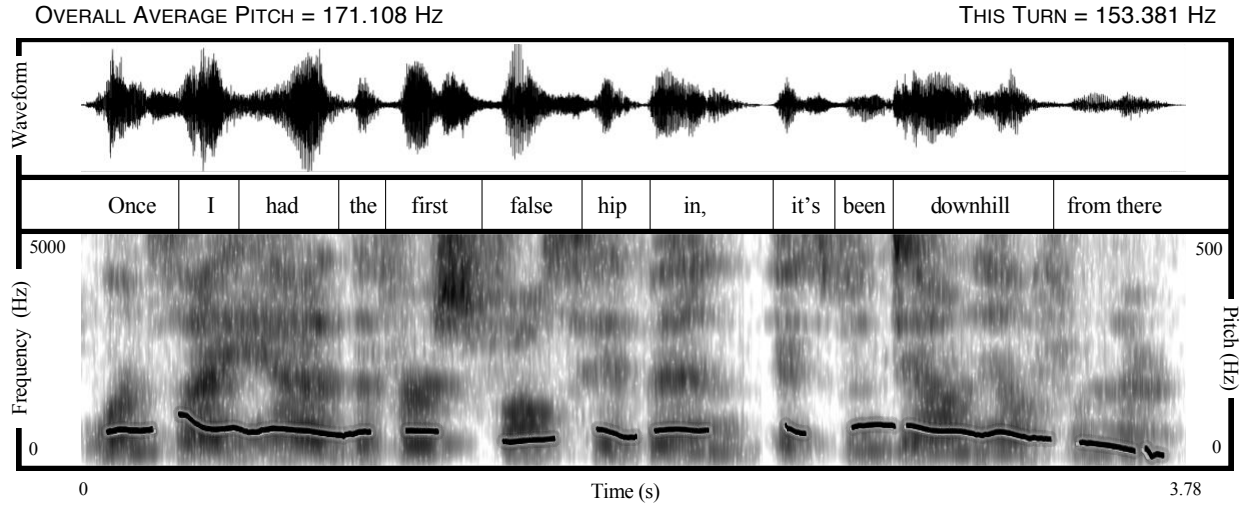
Examples of instances in which both patients lower their pitches when discussing chronic pain and opioids are shown in Figures 5.4 and 5.5 below.

Figure 5.4: Example of pain narration from PAT D



Note: Waveform (above) and spectrogram (below) of a turn in which PAT D discusses pain. The dense line on the spectrogram represents pitch. The mean pitch of the present turn is below her overall average and covers only the lower 22% of her vocal range.

Figure 5.5: Example of pain narration from PAT E



Note: Waveform (above) and spectrogram (below) of a turn in which PAT E discusses pain. The dense line on the spectrogram represents pitch. The mean pitch of the present turn is below her overall average and covers only the lower 20% of her vocal range.

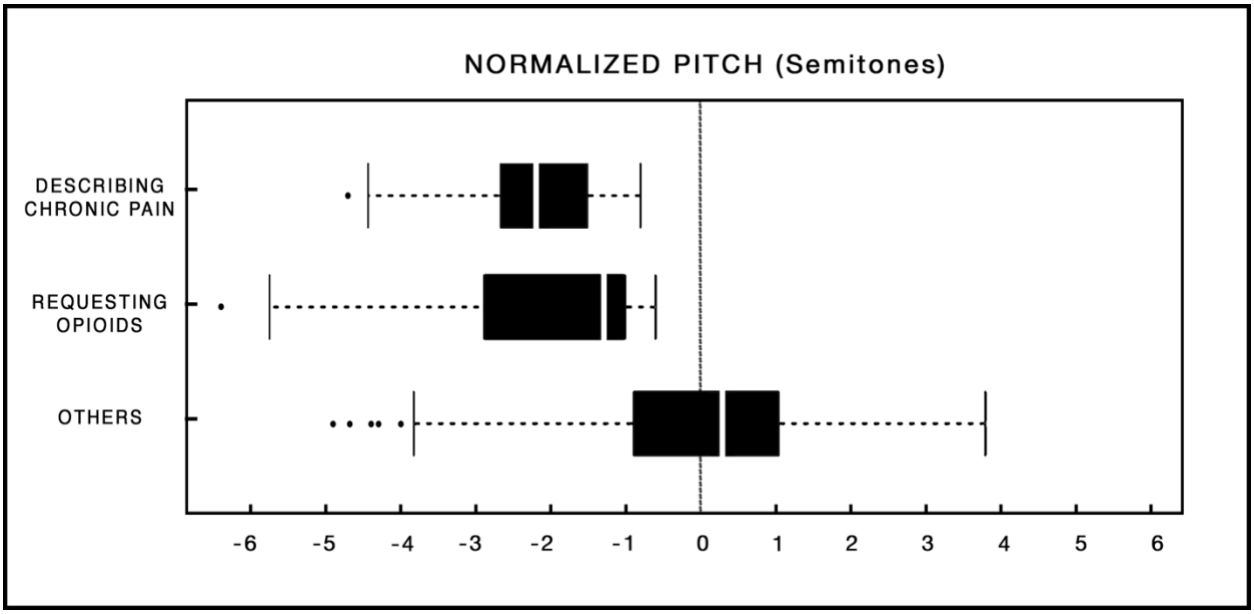
Pitch values were also extracted in semitones because the logarithmic values closely resemble perception and account for both speakers' differences. The values were then normalized by calculating the distance between the pitch measurements of each speaker's individual turns and the same speaker's baseline (median). Table 5.8 breaks down the pitch of both patients in semitones according to the same categories used earlier. Boxplots (Figure 5.6) were selected to represent the data since the graph sufficiently illustrates the distance between the turns in question and the baseline (represented by 0). Figure 5.6 presents the same data as Figure 5.3, except the measures are in semitones.

Table 5.8: Average pitch (in st) for each subcategory

	Average pitch (in st)			
	PAT D		PAT E	
Baseline: Overall median (x̃) pitch	**11.7**		**9.4**	
	st	norm	st	norm
(**a) Chronic pain (Opioid context)**	**10.7**	**-1.0**	**8.1**	**-1.3**
Request for opioids	10.1	-1.6	7.1	-2.3
Narration/description of chronic pain	9.5	-1.0	7.3	-2.1
Positive assessment of opioids	12.0	0.3	9.8	0.4
Negative assessment of opioids	--	--	--	--
Ambiguous assessment of opioids	--	--	9.6	0.2
Opioid-related red flags and threats	12.2	0.5	7.0	-2.4
(b) Other pain (Non-opioid context)	**11.7**	**0**	**8.8**	**-0.6**
Request for non-opioid medication	--	--	8.7	-0.7
Unclear requests	12.7	1.0	--	--
Request for information	11.6	-0.1	10.5	1.1
Positive assessment of non-opioid treatment	--	--	7.5	-1.9
Negative assessment of non-opioid treatment	11.8	0.1	10.2	0.8
Ambiguous assessment of non-opioid treatment	--	--	10.2	0.8
General agreements	--	--	8.6	-0.8
General disagreements	12.1	0.4	--	--
Other pain-related utterances	11.6	-0.1	8.5	-0.9
(c) Non-pain	**12.2**	**0.5**	**10.4**	**1.0**

Note: Negative normalized st values indicate that the average pitch of that category is lower than the speaker's baseline.

Figure 5.6: Pitch values in semitones



Note: Boxplots of both patients' normalized pitch values. The gap in the middle of each boxplot represents the median for that category.

The entire plot of the first two categories, *Describing chronic pain* and *Requesting opioids*, were on the negative side, which indicates that the pitch values for both were less than the baseline (i.e., the median semitone). As expected, the median for all other utterances is slightly on the positive side of the baseline since the two other categories with lower medians were separated. Otherwise, the first two categories would have dragged the median toward the baseline. The semitone values also corroborate the earlier findings in this study. The next section presents the findings on the use of the non-modal phonation creak.

5.4.2 Entirely creaky speaking turns

Although reliable pitch values cannot be extracted from entirely creaky turns, they were still coded into categories to identify the contexts in which the phonation was produced.

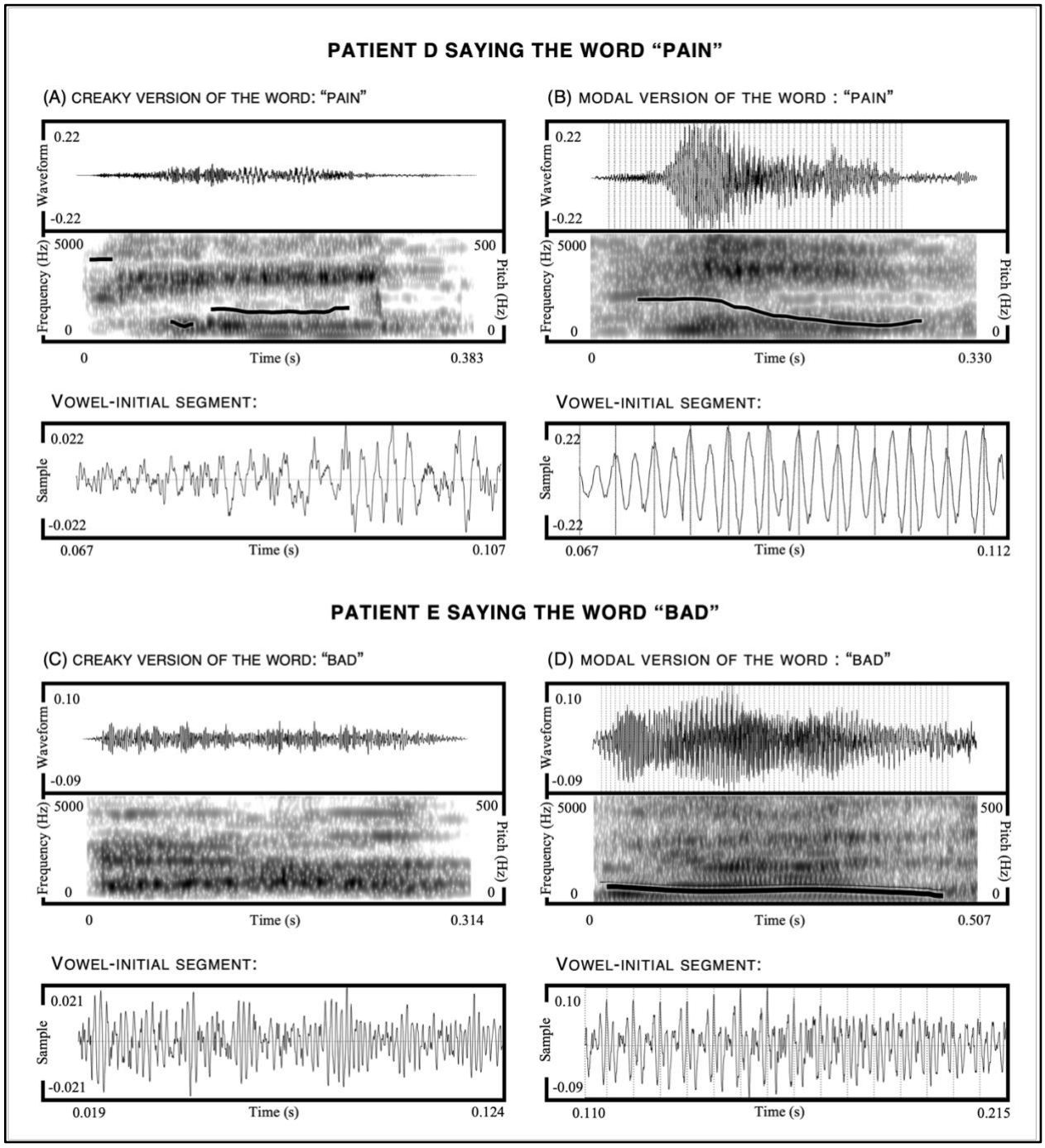
Table 5.9: Distribution of completely creaky speaking turns

	Number of creaky turns	
	PAT D	PAT E
Context: Pain	11	35
Context: Non-pain	6	6

Note: None of the completely creaky turns were measured for pitch.

Of all of the creaky turns, 65% of PAT D's and 85% of PAT E's were about pain. Figure 5.7 provides examples of waveforms and spectrograms of words articulated in both creaky and modal phonation by the participating patients. At the bottom of each example are waveforms zoomed into the beginning of the vowel to show the differences in periodicity, useful in identifying creaky phonation.

Figure 5.7: Distinguishing creak from modal



Note: Waveforms and spectrograms illustrating the creak and modal versions of the words "pain" and "bad" spoken by Patients D and E, respectively. The line on the spectrogram refers to pitch. The waveform for the beginning of the vowel is also presented.

5.5 Discussion

The study demonstrates that pitch or f0 values were lower and that the use of creak was more apparent when both patients discussed chronic pain and opiates. Because both phonation styles are associated with the lower vocal tract and the use of lower register, it is not unexpected for creaky segments to be detected in utterances with low modal pitch, as shown in the examples below.

In Excerpt (1), PAT D informs the doctor about not being prescribed with opioids by another physician. The primary reasons for the denial include PAT D's toxicology results and the fact that she is already taking another opioid from another pain clinic. (The boxed numbers indicate the mean pitch values of the modal segments in that turn while utterances in bold denote creak.)

(1)

1	DOC D:		Alright. So, um, alright, let's start with what you would like to talk about**.**
2	PAT D:	139.9 Hz	Okay, and I was very upset with my last visit with Dr. <name>.
3	DOC D:		Mm-mm.
4	PAT D:	136.1 Hz	He wouldn't prescribe any an— any meds, any pain medication that day, so I've been without Norco for almost two months now.
5	DOC D:		Hm-mm.
6	PAT D:	181.4 Hz	I've been in extreme pain, with my shoulder that is still hurting. I can't do physical therapy, because my— I might even need to have surgery**. I wanna see the s— the surgeon again, because it's just not healing.**
7	DOC D:		Hm-mm.

8	PAT D: 169.5 Hz	**It's not healing at all**. And, I mean, he's with me day and night practically when he's not at work and for the past four years we've been together, and **he can verify, um, the pain that I'm going through—with all this.**

Lines 6 and 8 are examples of turns in which PAT D describes her pain using low pitch and creak. In both turns, the patient's pitch is 7% and 13% lower, respectively, compared to her overall average of 195.298 Hz. In Line 4, PAT D proves that not all requests have to take the interrogative form. According to Robinson (2001), implicit or indirect requests can take any grammatical form as long as the utterance performs its soliciting function in the context of the medical visit. Line 4 is coded as an opiate request because the purpose of the turn was not only to inform the physician that no opiate had been prescribed but also to suggest that the situation must be addressed. In this turn, the patient's pitch is 30% lower than the baseline.

The pairing of low pitch and creak in opiate requests is also discernible in PAT E's speech, as shown in Excerpt (2) below. In the beginning of this exchange, PAT E asks to be prescribed with Cymbalta, Neurontin, and Lyrica, none of which are opiates. She proceeds to talk about the main reason for her visit, which is to get the opiate, Dilaudid, added into her pain contract. (Utterances in bold denote creak.)

(2)

1	DOC E:	How can I help you today?
2	PAT E: 166.0 Hz	Uh, there's a few things. Uh, the Cymbalta that—I don't remember his name, but the last doctor I saw put me on the Cymbalta.
3	DOC E:	Yeah.
4	PAT E: 152.6 Hz	Uh, I don't have any more, and there was [*sic*] no refills, so—I've still got that.

5	DOC E:	I can certainly refill that for you if that seems to be helping.
6	PAT E: 160.7 Hz	Okay. Yeah, I think it does help a little bit with **the anxiety and stuff.** I don't know if it's helping with the pain, **um—**
7	DOC E:	The, the effect on the pain might be sort of subtle... It may, it may be helping to reduce the amount of other pain medicines you require.
8	PAT E: 172.2 Hz	**Unless— My— Cuz [*sic*] I did pretty good—I think—with the Dilaudid they did give me.** And also, uh, I took the Neurontin three times a day. I really have a hard time remembering to do that three times a day all the time.
9	DOC E:	Uh huh.
10	PAT E: 184.5 Hz	And I, I have taken Lyrica before. It was just a two-week trial...

In the example above, PAT E lists four medications she wants prescribed, yet it's worth noting that creak was only employed in the discussion of Dilaudid in Lines 6 and 8. In Line 6, PAT E introduces the idea that Cymbalta does not address her chronic pain, which consequently leads to the reveal that it is the opiate Dilaudid that helps in Line 8. The comments on Lines 6 and 8 are coded as requests—implicitly delivered through negative evaluation of a non-opiate drug in Line 6 and a positive assessment of the opiate in Line 8. From Line 10 up until opiates are discussed again, PAT E goes back to speaking with her regular modal voice, making more apparent the use of low pitch on discussions about controlled substances and chronic pain.

Irvine (2001) suggests that the motivations behind the use of certain linguistic styles could be interpreted by examining situations in which it is absent. The present analysis shows that requests for non-opiate medication have no semblance of low pitch and creak, as shown in the example below:

1	PAT E: 193.4 Hz	Oh, the Robaxin. Um, could you guys change that from 100 to 120 tablets for a month?

In the example, the request for the muscle relaxant Robaxin takes the conventional interrogative form. Such a straightforward request contrasts the suggestive opiate requests presented earlier. In fact, both patients started the discussion on opioids by "reporting" its effectiveness while simultaneously highlighting the presence and severity of their chronic pain. According to Robinson (2001) and Gill et al. (2001), reporting—in the form of assessments—is used by patients to implicitly make sensitive requests like asking for addictive medications, without revealing their position regarding the request.[5]

Excerpt (3) below illustrates an exchange in which PAT E neither uses creak nor lowers her pitch to discuss a condition that is not addressed by an opioid.

(3)

1	DOC E:	Anything else that, uh, I can help you with today?
2	PAT E: 193.0 Hz	Uh, my asthma. I live in Sunnyville, and it was pretty much fogged in smoke.
3	DOC E:	Okay.
4	PAT E: 190.5 Hz	And it started bothering my asthma right away.
5	DOC E:	Oh.
6	PAT E: 194.7 Hz	My sat was 95, but— I've been using my inhaler a lot.

The data show that both patients find value in switching to a distinct register when discussing chronic pain and opiates. Going back to Cruttenden's (1997) notion about register, the

salient shifting in pitch indicates emphasis to what is being said. Both patients overwhelmingly using low pitch and creak in very specific contexts tells us that both linguistic variables are being employed for stylistic work. Specifically, both phonation styles serve as pragmatic resources used to express pain as well as to request the medication that they believe best manages their misery.

5.5.1 The nature of opioid-related utterances

These findings raise a significant question: *What is distinct about the topics of chronic pain and opiates that motivate the change in vocal style?* The opioid crisis has attached a stigma to the discussion of controlled substances, which has made requesting opioids a fraught process within the medical setting, as evidenced by the suggestive framing of requests by the patients. Roberts and Kramer (2014) found that patients orient issues surrounding pain medications as problematic, morally suspect, and easily refusable. Patients have to confront the effects of the opioid crisis by increasing their sensitivity toward the potential concerns that doctors may have about dependency and addiction when prescribing opioids. Frequently, patients find it necessary to defend their moral character and present themselves as credible, responsible, and aware when the topic and requests are sensitive, challenging, potentially controversial, and morally fraught, with high chances of denial. It is evident from the findings that such tasks are accomplished by both patients through the situational use of low pitch and creak.

What sets opioid-related conversations further apart is the fact that it could be a source of disagreement because patients and physicians often do not share the same priorities when it comes to managing chronic pain (Henry et al., 2017). In fact, a post-visit survey given to the participants in this study reveals that both patients ranked “reducing pain intensity” as their most

important goal while their respective physicians placed higher emphasis on improving the patient's overall function. Alerting physicians about the use of specific vocal features in disagreeable discussions like opioids could alert them to the disagreement so they can confront it by returning the conversation to goal-setting.

Clearly, the findings suggest that the dynamics involved in medical encounters involving chronic pain and opiates are indeed different from other primary care visits. If the entirety of PAT D's appointment was about her constipation while PAT E's was about her asthma, the linguistic practices they would employ throughout their consultations would be less likely to involve creak and pitch lowering, as suggested by the way they discussed these same concerns in the consultations probed in this study.

5.5.2 Discourse functions: Expressiveness of low pitch and creak

Patients cannot always show visible evidence of chronic pain; therefore, their only recourse is to express their symptoms using the primary activity that takes place in medical interactions: talking. This raises the question as to why creak and low pitch are used in conjunction with requests for opiates. What do these variables index or represent? Existing literature has noted the combination of low pitch/f0 and creak as linguistic devices portraying sadness (Bänziger & Scherer, 2005), misery and weakness (Wilce, 1997), and certainty and credibility (Borkowska & Pawlowski, 2011). According to Podesva (2007), the common denominator that describes the polysemic functions carried by a linguistic variable is its "expressiveness"— indexed within the particular discourse contexts in which the variable is repeatedly employed. As such, the analysis of the conversational contexts suggests that the discourse functions served by low pitch and creak include: (1) addressing medical issues that are

delicate, important, morally fraught, bound to receive an assessment, and could possibly be refuted; (2) self-reporting chronic pain symptoms, which could be difficult to prove and easily questioned due to the lack of methods to properly evaluate it; and (3) requesting addictive painkillers that could easily be refused or interpreted as drug-seeking behavior.

5.6 Summary

Regardless of intention, patients are tasked with navigating the challenging discussion of opioids, knowing well that their requests could be refused or their symptoms questioned. This chapter examined the voice qualities or acoustic features present in the patients' speech as they talk to their physicians about chronic pain management. Through prosodic discourse analysis, the results show that patients lowered their pitch and employed creak to discuss chronic pain and opioids with their physicians. Both features are associated outcomes of epilaryngeal constriction, which, in itself, carries paralinguistic functions (Moisik, 2013). The situational use of low pitch and creak informs us about the linguistic choices the participating patients consider to be appropriate when addressing fraught or delicate issues such as self-reporting chronic pain symptoms and requesting addictive painkillers.

6. Conclusions and Implications

"Damned if I do and damned if I don't." This response from one of the patient participants to the physician's warnings about opioid use disorder captures the complexities of the opioid crisis. Not only did the patient willingly resign to the physician's argument, but she also remained defiant to the solutions presented to her. Complicated exchanges—whether articulated through speech like in the example or expressed through writing in the case of policies—are precisely why it is necessary to investigate the role of language in various aspects of the opioid crisis. The way I see it, the principle is straightforward; it makes sense to understand the issue we are trying to address. This dissertation endeavored to start the conversation by shedding light on how the crisis has impacted policymaking and how such policies have influenced everyday cultural conversations surrounding pain and opioids.

The broad objective of this study was to investigate the discourses surrounding pain and the opioid crisis, with a particular focus on how the language practices of policymakers, patients, and physicians provide a window into pain management issues and the epidemic. Building on this goal, this dissertation was broken down into three sections, each identifying salient grammatical, discursive, or prosodic linguistic features emerging from top-down policies and bottom-up medical interactions. This dissertation also explores the practical implications of each section's findings. Doing so exemplifies how various forms of language permeate our everyday lives, from writing policies in legislative spaces to engaging in challenging, awkward conversations about policies and expressing emotions and requests in medical practice.

The study was carried out using a multimodal corpus composed of California opioid policies and audio recordings of doctor-patient consultations concerning chronic pain

management gathered from West Coast Medical Center in California. A multi-methodical approach to discourse analysis was chosen because it allows for a rounded, detailed, and thorough investigation of both written and spoken discourses in a way that captures the complexity of the opioid crisis. Discourse analysis is also adaptable and conducive to quantitative approaches. As documented in Section 2.2, discourse analysis has been a reliable method utilized in language policy research—particularly research concentrated on health policies and their enactments (e.g., Davis & Pope, 2010; Higgins, 2010; O'Malley, 2010; Martinez, 2008).

Each of the three components of this dissertation utilizes a specific discourse analysis approach to address its own specific version of the broader research question. This chapter brings these three strands together, situating their findings within the top-down/bottom-up framework of language policy and planning (specifically) and applied sociolinguistics (broadly).

First, I revisit the three core studies by reiterating the motivations behind the analysis, summarizing the findings, and presenting the practical implications and the limitations informing future research. I then present some methodological implications. Finally, I conclude by coming full circle with a discussion on how the findings of this dissertation exemplifies the potential for top-down policies and bottom-up interactions to inform each other.

6.1 The stakeholders

6.1.1 Part I: Policymakers

Policymakers, as the name suggests, write policies in order to address pressing concerns; in other words, they use language to address the opioid crisis. Considering that the very language used by policymakers to draft policies can influence the meanings we make from of them, this

dissertation focused on a key grammatical feature that consistently appeared in policy verb phrases: modality. It seems senseless to use these polysemic and potentially ambiguous auxiliaries over simple or straightforward language in addressing highly consequential issues such as the opioid crisis, warranting a closer investigation into the functions that modals serve in policies. Using corpus-based discourse analysis, I found that modality mirrors or calls attention to the gravity of local issues and reconfigures the interpretive spaces in which policy stakeholders like physicians and patients act.

6.1.2 Part II: Physicians

The opioid crisis has prompted numerous interdisciplinary investigations aimed at curbing inappropriate opioid prescribing, most of which cite collaborative partnerships as one of the best practices (Fishman, 2016; Henry et al., 2016; Hood-Medland et al., 2021). With chronic pain discussions becoming increasingly infused with distrust and policies growing stricter, medical consultations are becoming more contentious (Merrill et al., 2002).

This dissertation examined the discursive features used by physicians as they enact the increasingly restrictive opioid policies that could potentially be met with disagreement from patients. Through discourse analysis, I described eight different strategies used by physicians to save face while implementing opioid policies: pseudo requests, downtoners, broadening, redirection, tag questions, impersonalization, listing, and (negative) imagery

6.1.3 Part III: Patients

Due to the lack of physical manifestation and objective tests to prove the existence of chronic pain, patients must rely on communicating their symptoms and requests to physicians. Such communication is happening while discussions about opioids are becoming increasingly

associated with distrust and bringing up the topic could be interpreted as a drug-seeking behavior. Regardless of whether the opioids are to be used to mitigate chronic pain, satisfy addiction cravings, or both, the only way to leave the appointment with an opioid prescription is for patients to get physicians to write one. Doing so entails the patients having to convince their physicians that they are indeed experiencing pain and not simply fabricating symptoms.

This dissertation examined the voice quality or acoustic features present in the patients' speech as they talk to physicians during consultations on chronic pain management. The results of prosodic discourse analysis show that patients lowered their pitch and employed creak when discussing chronic pain and opioids with their physicians. The situational use of low pitch and creak informs us about how patients engage in register shifts when addressing fraught or delicate issues—in this case, self-reporting chronic pain symptoms and requesting addictive painkillers.

6.2 Practical implications, limitations, and future research

In this section, I discuss the ways in which this dissertation may contribute to our understanding of language use in policies and the medical space, as well as how each of the three parts are particularly relevant to various sectors of society, from linguists and other researchers to physicians and policymakers. After each implication, I then discuss the limitations and how they inform future studies.

6.2.1 Language of policymakers and modality

Part I provides a cogent applied linguistic framework for extending language policy and planning research that includes scholarship analyzing the language of policies through corpus-based discourse analysis. Chapter 3 also shows that the mining of modals from a complete and well-defined corpus can (1) provide researchers and policymakers an overview of the general

tone of policies (either restrictive or permissive), (2) reveal the entities to whom most restrictive and permissive policies are addressed, and (3) expose the actions policymakers prioritized through the use of restrictive language to limit optionality. Such information can inform future amendments and policy planning when addressing certain local concerns. The corpus-based approach to analyzing California's state policies can be replicated to study other policies elsewhere.

Using discourse analysis to make sense of language choices and the functionality of modals could benefit policymakers and legal aides who recognize the significance of using modals; it could also benefit policy stakeholders tasked with interpreting modal-heavy policies to carry out certain functions and achieve outcomes. Focusing on modality provides a streamlined, big-picture view of how policies are being framed and has potential to save policymakers and researchers valuable time examining the policies related to pertinent local issues. For instance, a quick lexical and collocation search of modality can quickly provide an overview of the stance expressed in any given document.

Of course, Part I is not without its limitations, including the need to rely on proxies such as time and fatality rates to quantify the worsening crisis. Moreover, the restrictive-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).

6.2.2 Language of physicians and face-work

By identifying the physicians' face-work strategies while enacting opioid policies, Part II calls attention to the challenging nature of discussing opioids and chronic pain. Looking at the

bigger picture, the socialization process physicians must endure every time a new policy emerges could be streamlined; this could be achieved at the state policy level, through the codification of directives requiring institutions to offer communication support, or at the institutional and departmental levels, by providing some guidance on communicating policies to patients. Most policies focus only on the *What?* while brushing off the *How?* of policy implementation. Policymakers have demanded that physicians reduce their opioid prescribing but fail to acknowledge the difficulty of figuring out the best way to broach this topic to patients. Part II also offers policymakers an example of how their policies are being discussed by stakeholders. For instance, physicians' turns show policymakers that those who may share their sentiment struggle to enact their policies, while patients' turns may provide policymakers with an example of the ways in which those who disagree with their policies resist. The need for improved communication opens opportunities for collaborations between medical institutions that adapt state policies into their practices, physicians who interacts with chronic pain patients, and linguists whose limited exposure to the space provide a fresh yet critical perspective. Such a practical approach to enacting policies could indeed improve the efficacy of pain management and minimize the amount of face-work both physicians and patients must endure.

Although the taxing nature of enacting opioid policies can easily be gleaned from the presence of false starts, paraphrasing, and repairs—as detailed in the transcript—future investigations should aim to describe the prosodic and suprasegmental features associated with face-work in discourses concerning health and policy issues. It is important to note that, although Part II revealed the difficulties in communicating opioid policies, some of the discourse features discussed were potentially effective. In fact, some of the documented face-saving strategies, such as redirection, impersonalization, and broadening, resulted in cooperation (which, in this case,

includes policy enactments that are not met with pushbacks). Further investigation on the effectiveness of these features using a more extensive data pool could help uncover which features (or permutations thereof) effectively meet policy demands. Doing so could offer solutions to common quandaries such as choosing whether to give orders through pseudo requests, which was a technique prone to rejection in this study, or through a straightforward or unmitigated imperative. The physician participants in Part II noted that they often get briefed on new policies, but they do not consistently receive any form of guidance on how to communicate them to patients. The participants saw this as a result of busy administrators. Giving physicians, who have endured years of medical school, a print-out with sample dialogue may easily come across as disrespectful, if not insulting. Further investigations are needed to examine physicians' sensitivity when receiving guidance and to determine whether it would be more effective and efficient if the memos they currently receive are replaced with equally informative, ready-to-use templates that physicians could personalize.

While linguistic backgrounds were controlled for in this study, analyzing a larger corpus of interactions with additional emphasis on cultural identities and structures is important to offer an alternative lens through which healthcare policies and interactions involving controlled substances could be examined. The prospect of improving how institutions assist policy stakeholders—from medical professionals to frontline workers—in the discursive aspects of enacting policies serves as a continuous incentive for future research in this space.

6.2.3 Language of patients and voice quality

Part III expands the breadth of acoustic or phonetic analysis within the domain of discourse analysis, leading to the need to explore topics involving the illocutionary role of the

lower vocal tract in expressing emotions. The investigation into voice quality shows that studying micro-linguistic practices in the medical space has the potential to inform and, thus, improve the overall efficacy of health communication, which is vital for setting shared pain management goals and reducing inappropriate opioid prescribing (Henry et al., 2017). For instance, physicians being aware of the discourse functions of low pitch and creak as expressive features meant to call attention to what is being said may alert them to the possible concerns patients are having about the ongoing discussion. Recognizing such a discernible shift in register could also alert the physician into bringing the discussion back toward their shared goals or probing the patient about any issues they might like to share. I have discussed how policymakers could codify into state policies that medical institutions must offer their physicians some guidance on effectively communicating disagreeable opioid policies. Perhaps such guidance could include a reminder for physicians to be cognizant of patients' register shifts, a list of frequently recurring issues that may motivate patients' voice shifting or unusual, and sample dialogue physicians could adapt to address such situation.

Looking forward, additional investigations involving a more diverse group of participants could provide more definitive evidence on the use of creak and low pitch (specifically) or register shifting (generally) in opioid discussions. Lastly, examining the correlation between physicians' auditory judgments and prescribing decisions through a perception test, including a matched guise, could also further the study presented in this chapter toward discussions of equity in healthcare access.

6.3 Methodological implications

One of the goals of this dissertation is to show how the synergistic relationship between quantitative and qualitative approaches could result in a robust examination of discourses ranging from policies to their enactments. This section discusses the approaches (or amalgamations thereof) particular to this dissertation and their potential implications for future research.

Separating the interaction data into speaking turns—all utterances of one speaker before another intervenes—allowed for a more harmonious analysis of pitch in Part III, especially since the pitch of an utterance may affect the others before and after it when spoken within a single turn. Similarly, speaking turns worked well with the coding of physician speech in Part II. The decision came from the idea that, since conversations are sequential in nature, simultaneous utterances are more likely to cover the same context and are coded similarly as a result. Coding done in tandem (Section 3.3.2) introduced an innovative way to approach working in groups and proved to be an approach that could be accomplished virtually, reshaping the way research of this nature is carried out.

As discussed in more depth in Section 5.3.3, the prosodic analysis in Part III was conducted from an intraspeaker perspective—the assessment of one's voice quality against the same individual's voice quality in other contexts (Podesva, 2007). What separates this dissertation from several studies on intraspeaker variation (e.g., Mendoza-Denton, 2011; Podesva, 2007) is the study's approach to what "context" entails. Most intraspeaker research examines a speaker's voice quality in various settings and with different interlocutors. Such an approach was not feasible for Part III due to ethical and privacy considerations involved in

dealing with health information. Hence, there were no ways to gather data on patient interactions beyond the walls of WCMC. Instead, this dissertation treated the various topics discussed in consultations as the contexts against which voice quality was examined. On one hand, knowing how the patients interacted in other situations could inform the findings of this dissertation. However, the study of intraspeaker variation within the confines of the consultation room mimics the extent to which patients and physicians connect. If physicians were to prescribe opioids, they would have to rely on the information in front of them; it is highly improbable for physicians to know how their patients talk about chronic pain to their friends outside of consultations. Existing intraspeaker research has outlined different voice qualities in different settings. This dissertation shows that zooming in on intraspeaker variation in limited settings could still inform the very discourses being investigated.

Another innovation incorporated into the analytic processes in Part III was the use of a speaker's overall average pitch as a baseline. The approach was inspired by Cruttenden's (1997) notion of markedness. Having a baseline was an essential requisite that gave way to illustrating pitch values. I find the use of baselines to be an effective approach to investigating spontaneous speech without the need of hiring voice performers, which, as mentioned in Section 5.2.2, was how earlier studies gathered neutral speech stimuli to use as a baseline for comparison (e.g., Zetterholm, 1998; Bänziger & Scherer, 2005). The approach in this dissertation also disrupts the typical process for marking pitch in discourse analysis. Usually, pitch and intonation are observed and judged by researchers as they listen along. I find such a straightforward approach practical for studies about hearing individuals who encounter pitch through perception anyway. However, the acoustic analysis of voice was incorporated in Part III to account for the nuanced pitch-shifting expected from interlocutors in enclosed spaces and in close proximity to one

another. While the pitch shifting in discussions about opioids and chronic pain was so marked that human perception may have been enough, the entire data set had to be treated consistently. Thus, the acoustic component allowed the comparison of what was heard from the recordings with what was seen in the acoustic data. Lastly, introducing the acoustic component into the study provided requisite information to illustrate the data.

6.4 Coming full circle: The cycle of top-down policies and bottom-up interactions

At this stage of the dissertation, I unpacked what the findings from the three studies tell us about both top-down and bottom-up perspectives. As has already been defined in more detail in Section 1.2, analyzing policies from a top-down (macro-level) perspective shows an interest in how governing entities solve issues through policies, while investigations conducted from a bottom-up (micro-level) perspective concern themselves with how said policies are processed and experienced by local stakeholders. This dissertation studied policies and interactions from both perspectives, with language as the unifying theme.

Part I demonstrated that the top-down response to the opioid crisis was for policymakers to use stricter language, which they achieved by altering modality to match pressing societal demands. Part II showed how physicians coped with top-down policy demands by accompanying policy implementation with face-work. Part III revealed how patients adjusted their voices to fare with the increasingly restrictive policies and the topic of opioids being fraught with distrust and suspicion.

Studies conducted through a top-down perspective have been heavily criticized for being too narrow and limiting (Das Gupta, 1970). This dissertation showed some merit to this argument, considering how the demands of top-down policies cast physicians as followers,

whose access to agency goes as far as interpreting policies and deciding whether to follow or defy them. At the same time, policymakers hold the privilege of writing policies that tell others how they are expected to act. However, there are also valuable realizations that emerged from a top-down examination of opioid policies.

Part I showed how language works in a very nuanced way, illustrating how a simple modal switch could immediately change the potential interpretations of a policy. The argument that modals are important part of policies becomes even more convincing as amendments show state legislators voting on bills in which only one lexical item—the modal verb—was changed in certain clauses. It makes sense for readers to forget the modal verb and to only remember the content words when reading policies. After all, such information paints a picture of what policies demand from stakeholders. Nonetheless, it is the modal that we read along the way that facilitates our actions (or inactions). When citing the motivation for analyzing modality, I mentioned how the overt use of such a polysemic grammatical feature seems counterproductive in policies concerning critical health issues since policies are meant to guide society, not confuse it. Part I opened up the realization that it is perhaps the presence of modality that make policies what they are and that taking modals away from policies would result in non-negotiable imperatives, which, in essence, deprives stakeholders of what remains of their agency.

The results of Parts II and III are in line with the realizations underscored in previous policy research: that it is through examining policies from a bottom-up perspective that the disconnect between policy demands and local enactments emerges (e.g., Canagarajah, 2005; Fairclough, 2003; Ramanathan, 2005 discussed in Section 1.2). Based on what can be gleaned from the findings, top-down policies do not consider how policies contribute to the communicative burden cast on physicians and the articulatory effort required from patients for

them to be able to engage in exchanges about chronic pain management. In Section 6.2, this dissertation has presented some practical implications deemed necessary by the bottom-up findings, such as mandating health institutions to offer communication guidance that physicians could use in interactions.

With language use being a mundane element of how we deal with the world, it is easy not to notice the many ways it shapes what we know and do. This applied linguistic dissertation lays the groundwork for future investigations interested in understanding the relationship between the language of top-down policies and bottom-up enactments. This dissertation, in its own way, also demonstrates the various ways in which grammatical, acoustic, and discursive features inform one another and advance our understanding of written and spoken discourses. Lastly, this project illustrates the many ways in which linguistic domains and methodologies can come together to highlight the impact that sounds, words, meanings, and interpretations have when addressing pressing societal concerns.

References

Agency for Health Care Policy and Research. (1992). *Acute pain management: operative or medical procedures and trauma.* Rockville, Md.: U.S. Dept. of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research.

Aijmer, K. (2002). *English Discourse Particles: Evidence from a Corpus*. John Benjamins Publishing.

Ainsworth-Vaughn, N. (1998). *Claiming power in doctor-patient talk*. New York: Oxford University Press.

American Pain Society. (1999). *Guideline for the management of acute and chronic pain in sickle cell disease*. American Pain Society.

Anderson, R. C., Klofstad, C. A., Mayew, W. J., et al. (2014) Vocal fry may undermine the success of young women in the labor market. *PloS one* 9(5): e97506.

Apthorpe, R., & Gasper, D. (2014). Introduction: Discourse analysis and policy discourse. In *Arguing Development Policy* (pp. 7–21). Routledge.

Arborelius, E., & Thakker, K. D. (1995). Why is it so difficult for general practitioners to discuss alcohol with patients? Family Practice, 12(4), 419–422. https://doi.org/10.1093/fampra/12.4.419

Aronsson, K., & Sätterlund-Larsson, U. (1987). Politeness Strategies and Doctor-Patient Communication. On the Social Choreography of Collaborative Thinking. *Journal of Language and Social Psychology*, 6(1), 1–27. https://doi.org/10.1177/0261927X8700600101

Asprey, M. M. (1992). Shall must go. *Scribes Journal of Legal Writing*, *3*, 79-84.

Austin, J. L. (1962). *How to do things with words*. Harvard University Press. Baker, P. (2006). *Using corpora in discourse analysis*. A&C Black.

Ball, M. J. (2005). *Clinical sociolinguistics* (Vol. 36). John Wiley & Sons.

Ball, S. J. (1990). *Politics and policy making in education: Explorations in policy sociology*. Routledge.
Bänziger, T., & Scherer, K. R. (2005). The role of intonation in emotional expressions. *Speech Communication*, *46*(3–4), 252–267.

Beach, W. A. (1993). Transitional regularities for 'casual' "Okay" usages. *Journal of Pragmatics*, *19*(4), 325–352.

Beach, W. A. (2020). Using prosodically marked “Okays” to display epistemic stances and incongruous actions. *Journal of Pragmatics*, *169*, 151–164.

Beach, W. A., & Dixson, C. N. (2001). Revealing moments: Formulating understandings of adverse experiences in a health appraisal interview. Social Science & Medicine, 52(1), 25–44. https://doi.org/10.1016/S0277-9536(00)00118-0

Bendor, D. and Wang, X. (2005) The neuronal representation of pitch in primate auditory cortex. *Nature* 436(7054): 1161.

Benkendorf, J. L., Prince, M. B., Rose, M. A. et al. (2001). Does indirect speech promote nondirective genetic counseling? Results of a sociolinguistic investigation. *American Journal of Medical Genetics*, 106(3), 199–207. https://doi.org/10.1002/ajmg.10012

Berry, D. A. (2001). Mechanisms of modal and nonmodal phonation. *Journal of Phonetics*, *29*(4), 431–450.

Bhatia, V., Flowerdew, J., & Jones, R. H. (2008). *Advances in discourse studies*. Routledge.

Biber, D. (2006). Stance in spoken and written university registers. *Journal of English for Academic Purposes*, *5*(2), 97–116.

Biber, D., Reppen, R., & Friginal, E. (2012). Research in Corpus Linguistics. In *The Oxford Handbook of Applied Linguistics*, (2 Ed.). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780195384253.013.0038

Birkland, T. A. (2015). *An introduction to the policy process: Theories, concepts, and models of public policy making*. Routledge.

Boersma, P., & Weenink, D. (2013). Praat: Doing phonetics by computer [Computer program]. Version 5.3.51. *Http://Www.Praat.Org/*, *12*.

Borkowska, B. and Pawlowski, B. (2011) Female voice frequency in the context of dominance and attractiveness perception. *Animal Behaviour* 82(1): 55–59.

Boyd, J., & Thorne, J. P. (1969). The semantics of modal verbs. Journal of Linguistics, 5(1), 57–74. https://doi.org/10.1017/S002222670000205X

Brown, P., & Levinson, S. C. (1987). *Politeness: Some universals in language usage* (21. pr). Univ. Press.

Brown Jr, E. G., Sewell, D. S., & Kirchmeyer, K. (2014). Guidelines for prescribing controlled substances for pain. *Medical Board of California.* https://www.ombc.ca.gov/forms_pubs/pain_guide.pdf

Bucholtz, M., & Hall, K. (2005). Identity and interaction: A sociocultural linguistic approach. *Discourse Studies*, *7*(4–5), 585–614.

Byrne, P. S., & Long, B. E. (1976). Doctors talking to patients. A study of the verbal behaviour of general practitioners consulting in their surgeries. *Royal College of General Practitioners.*

Caballero, J. A., Vergis, N., Jiang, X., & Pell, M. D. (2018). The sound of im/politeness. Speech Communication, 102, 39–53. https://doi.org/10.1016/j.specom.2018.06.004

Caffi, C. (1999). On mitigation. Journal of Pragmatics, 31(7), 881–909. https://doi.org/10.1016/S0378-2166(98)00098-8

California Board of Registered Nursing. (2000). *The BRN Report* (No. 13(1)). Retrieved from California Board of Registered Nursing website: https://www.rn.ca.gov/pdfs/forms/brn500.pdf

Canagarajah, A. S. (Ed.). (2005). *Reclaiming the local in language policy and practice*. L. Erlbaum Associates.

Caudill-Slosberg, M. A., Schwartz, L. M., & Woloshin, S. (2004). Office visits and analgesic prescriptions for musculoskeletal pain in US: 1980 vs. 2000. *Pain*, *109*(3), 514–519.

Centers for Disease Control and Prevention, National Center for Health Statistics. Compressed Mortality File 1968-1978. CDC WONDER Online Database, compiled from Compressed Mortality File CMF 1968-1988, Series 20, No. 2A, 2000. Accessed at http://wonder.cdc.gov/cmf-icd8.html on Jun 24, 2020 3:54:52 AM

Centers for Disease Control and Prevention, National Center for Health Statistics. Compressed Mortality File 1979-1998. CDC WONDER On-line Database, compiled from Compressed Mortality File CMF 1968-1988, Series 20, No. 2A, 2000 and CMF 1989-1998, Series 20, No. 2E, 2003. Accessed at http://wonder.cdc.gov/cmf-icd9.html on May 24, 2020 5:21:35 AM

Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999-2018 on CDC WONDER Online Database, released in 2020. Data are from the Multiple Cause of Death Files, 1999-2018, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at http://wonder.cdc.gov/mcd-icd10.html on Jun 24, 2020 4:18:08 AM

Centers for Disease Control and Prevention. (2011). Prescription painkiller overdoses at epidemic levels [Press Release]. https://www.cdc.gov/media/releases/2011/p1101_flu_pain_killer_overdose.html

Cernak, M., Orozco-Arroyave, J. R., Rudzicz, F., et al. (2017). Characterisation of voice quality of Parkinson's disease using differential phonological posterior features. Computer Speech & Language, 46, 196–208.

Chafe, W. L. (1993). Prosodic and functional units of Language. In M. D. Lampert & J. A. Edwards (Eds.), *Talking data: Transcription and coding in discourse research* (Vol. 33, pp. 24–43). Hillsdale, N.J.: Lawrence Erlbaum Associates.

Chen, Z. (2012). Expression of Epistemic Stance in EFL Chinese University Students' Writing. *English Language Teaching*, *5*(10), 173–179.

Chilton, P. A. (2004). *Analysing political discourse: theory and practice*. London; New York: Routledge.

Clark, S. J., & Hudak, P. L. (2011). When Surgeons Advise Against Surgery. Research on Language & Social Interaction, 44(4), 385–412. https://doi.org/10.1080/08351813.2011.619313

Coates, J. (1983). *The semantics of the modal auxiliaries* (Croom Helm Linguistics Series). London, Sydney & Dover, NH: Croom Helm.

Coffin, C., & O'halloran, K. (2005). Finding the global groove: Theorising and analysing dynamic reader positioning using Appraisal, corpus, and a concordancer. *Critical Discourse Studies*, *2*(2), 143–163. https://doi.org/10.1080/17405900500283607

Couper-Kuhlen, E. (2015) Intonation and discourse. In: Tannen D, Hamilton HE, and Schiffrin D (eds) *The Handbook of Discourse Analysis*. John Wiley & Sons, Inc. Hoboken, NJ, USA, pp. 82–104.

Cruttenden, A. (1997). *Intonation*. Cambridge: Cambridge University Press.

Das Gupta, J. (1970). *Language Conflict and National Development: Group Politics and National Language Policy in India* (Vol. 5). Univ of California Press.

Dassieu, L., Heino, A., Develay, É., et al. (2021). Conversations About Opioids: Impact of the Opioid Overdose Epidemic on Social Interactions for People Who Live With Chronic Pain. Qualitative Health Research, 10497323211003064. https://doi.org/10.1177/10497323211003063

Davis, B. H., & Pope, C. (2010). Institutionalized ghosting: Policy contexts and language use in erasing the person with Alzheimer's. Language Policy, 9(1), 29–44. https://doi.org/10.1007/s10993-009-9153-8

Davis, K. A. (1999). The sociopolitical dynamics of indigenous language maintenance and loss: A framework for language policy and planning. In T. Huebner & K. A. Davis (Eds.),

Sociopolitical perspectives on language policy and planning in the USA (pp. 67–97). Amsterdam/Philadelphia: John Benjamins Publishing Company.

De Looze, C., & Hirst, D. J. (2014). The OMe (Octave-Median) scale: A natural scale for speech melody. *Proceedings of the Seventh International Conference on Speech Prosody, Dublin, Ireland*, 20–23.

Department of Veterans Affairs. (2000). *Pain as the 5th vital sign toolkit.* Washington, DC: Department of Veterans Affairs.

Divjak, D., & Fieller, N. (2014). Cluster analysis: Finding structure in linguistic data. In D. Glynn & J. A. Robinson (Eds.), *Corpus methods for semantics: Quantitative studies in polysemy and synonymy* (Vol. 43, pp. 405–441). John Benjamins Publishing Company. https://doi.org/10.1075/hcp.43.16div

Dori-Hacohen, G. (2020). The "Long List" in oral interactions: Definition, examples, context, and some of its achievements. Pragmatics. Quarterly Publication of the International Pragmatics Association (IPrA), 30(3), 303–325. https://doi.org/10.1075/prag.19007.dor

Du Bois, J. W., Schuetze-Coburn, S., Cumming, S., et al. (1993). Outline of discourse transcription. *Talking Data: Transcription and Coding in Discourse Research*, 45–89.

Dudy, S., Bedrick, S., Asgari, M., et al. (2018). Automatic analysis of pronunciations for children with speech sound disorders. *Computer speech & language* 50: 62–84.

Epstein, R., Morse, D., Frankel, R., et al. (1998). Awkward Moments in Patient-Physician Communication about HIV Risk. Annals of Internal Medicine, 128, 435–442. https://doi.org/10.7326/0003-4819-128-6-199803150-00003

Esling, J. H. (1978) The identification of features of voice quality in social groups. *Journal of the International Phonetic Association* 8(1–2): 18–23.

Esling, J. H. (2012). Voice Quality. In C. A. Chapelle (Ed.), The Encyclopedia of Applied Linguistics. Blackwell Publishing Ltd. https://doi.org/10.1002/9781405198431.wbeal1271

Esling, J. H., Moisik, S. R., Benner, A. et al. (2019). *Voice quality: The laryngeal articulator model*. Cambridge University Press.

Evans-Agnew, R. A., Johnson, S., Liu, F., & Boutain, D. M. (2016). Applying Critical Discourse Analysis in Health Policy Research: Case Studies in Regional, Organizational, and Global Health. *Policy, Politics, & Nursing Practice*, *17*(3), 136–146.

Eyben, F., Scherer, K. R., & Schuller, B. W. et. al. (2015). The Geneva minimalistic acoustic parameter set (GeMAPS) for voice research and affective computing. *IEEE Transactions on Affective Computing*, *7*(2), 190–202.

Fairclough, N. (2003). *Analysing discourse: Textual analysis for social research*. Psychology Press.

Fairclough, N., & Wodak, R. (1997). Critical discourse analysis. In T. A. Van Dijk (Ed.), *Discourse as social interaction* (Vol. 2, pp. 258–284). Sage.

Feuerherm, E. (2013). Keywords in refugee accounts: Implications for language policies. In V. Ramanathan (Ed.), *Language policies and (dis) citizenship: Rights, access, pedagogies* (pp. 52–72).

Fillmore, C. J. (1975). An alternative to checklist theories of meaning. *Annual Meeting of the Berkeley Linguistics Society*, *1*, 123–131.

Fillmore, C. J. (1976). Frame semantics and the nature of language. *Annals of the New York Academy of Sciences*, *280*(1), 20–32.

Fishman, J. A., Ferguson, C. A., & Das Gupta, J. (1968). *Language problems of developing nations*. Wiley New York.

Fishman, S. M. (2016). Strengthening Pain Content in Medical (p. 17). University of California, Davis Medical Center. https://mri.ucdavis.edu/advancingpainrelief/pdf/CAPR_AAMC%20Mapping%20report_1.17.1.pdf

Fleiss, J. L. (1971) Measuring nominal scale agreement among many raters. *Psychological bulletin* 76(5): 378–382.

Flowerdew, L. (2008). Corpora and context in professional writing. *Advances in Discourse Studies*, 115–127.

Ford, R. (2011). Interpersonal challenges as a constraint on care: The experience of nurses' care of patients who use illicit drugs. *Contemporary Nurse*, 37(2), 241–252. https://doi.org/10.5172/conu.2011.37.2.241

Fowler, R. (Ed.). (1979). *Language and control*. London: Routledge & Kegan Paul.

Friedlander, M. L., Heatherington, L., & Marrs, A. L. (2000). Responding to blame in family therapy: A constructionist/narrative perspective. *The American Journal of Family Therapy*, *28*(2), 133–146.

Friginal, E., & Hardy, J. A. (2020). *The Routledge Handbook of Corpus Approaches to Discourse Analysis*. Routledge.

Gales, T. (2009). `Diversity' as enacted in US immigration politics and law: A corpus-based approach. *Discourse & Society*, 20(2), 223–240. https://doi.org/10.1177/0957926508099003

García, O., & Flores, N. (2012). Multilingual pedagogies. In *The Routledge handbook of multilingualism* (pp. 249–263). Routledge.

Garzone, G. (2013). Variation in the use of modality in legislative texts: Focus on shall. Journal of Pragmatics, 57, 68–81. https://doi.org/10.1016/j.pragma.2013.07.008

Gee, J. P. (2000). The new literacy studies: From 'socially situated' to the work of the social. In D. Barton, M. Hamilton, & R. Ivanič (Eds.), Situated Literacies: Reading and Writing in Context (pp. 180–196). London: Psychology Press.

Gee, J. P. (2011). *An introduction to discourse analysis: Theory and method* (3. ed). Routledge.

Gerhard, D. (2003) *Pitch Extraction and Fundamental Frequency: History and Current Techniques*. Department of Computer Science, University of Regina, Regina.

Gerratt, B. R., & Kreiman, J. (2001). Toward a taxonomy of nonmodal phonation. *Journal of Phonetics*, *29*(4), 365–381.

Gill, V.T, Halkowski, T. & Roberts, F. (2001) Accomplishing a request without making one: A single case analysis of a primary care visit. *Text–Interdisciplinary Journal for the Study of Discourse* 21(1–2): 55–81.

Goffman, E. (1955). On face-work: An analysis of ritual elements in social interaction. *Psychiatry*, *18*(3), 213–231.

Goodnow, F. J. (2017). *Politics and Administration: A Study in Government*. Routledge.

Gordon, M., & Ladefoged, P. (2001). Phonation types: A cross-linguistic overview. *Journal of Phonetics*, *29*(4), 383–406.

Gumperz, J. J. (1982) *Discourse Strategies*. Cambridge: Cambridge University Press.

Hacquard, V. (2016). Modals: Meaning Categories? *Mood, Aspect, Modality Revisited: New Answers to Old Questions*, 45–74.

Hajer, M. A. (2002). Discourse coalitions and the institutionalization of practice: The case of acid rain in Great Britain. In F. Fischer & J. Forrester (Eds.), *The Argument Turn in Policy Analisis and Planning* (pp. 51–84). Duke University Press.

Hamilton, H. E. (2005). *Conversations with an Alzheimer's patient: An interactional sociolinguistic study*. Cambridge University Press.

Hamilton, H. E., & Chou, W. S. (2014). *The Routledge handbook of language and health communication*. Routledge.

Haugen, E. (1959). Planning for a standard language in modern Norway. *Anthropological Linguistics*, 8–21.

Haugen, E. (1983). The implementation of corpus planning: Theory and practice. *Progress in Language Planning: International Perspectives*, *31*, 269–290.

Haugh, M. (2007). The co-constitution of politeness implicature in conversation. *Journal of Pragmatics*, *39*(1), 84–110.

Heath, C. (2002) Demonstrative suffering: the gestural (re) embodiment of symptoms. *Journal of Communication* 52(3): 597–616.

Henry, S. G., Bell, R. A., Fenton, J. J., et al. (2017) Goals of Chronic Pain Management. *The Clinical journal of pain* 33(11): 955–961.

Henry, S. G., Chen, M., Matthias, M. S., et al. (2016) Development of the Chronic Pain Coding System (CPCS) for characterizing patient-clinician discussions about chronic pain and opioids. *Pain Medicine* 17(10): 1892–1905.

Henry, S. G., & Eggly, S. (2013) The effect of discussing pain on patient-physician communication in a low-income, black, primary care patient population. *The Journal of Pain* 14(7): 759–766.

Henry, S. G., Gosdin, M. M., White, A. E., et al. (2019a). "It Sometimes Doesn't Even Work": Patient Opioid Assessments as Clues to Therapeutic Flexibility in Primary Care. Journal of General Internal Medicine, 35(6), 1635–1640.

Henry, S. G., & Matthias, M. S. (2018). Patient-clinician communication about pain: A conceptual model and narrative review. *Pain Medicine*, *19*(11), 2154–2165.

Henry, S. G., Paterniti, D. A., Feng, B., et al. (2019b). Patients' Experience With Opioid Tapering: A Conceptual Model With Recommendations for Clinicians. *The Journal of Pain*, 20(2), 181–191. https://doi.org/10.1016/j.jpain.2018.09.001

Henry, S. G., White, A. E. C., Magnan, E. M. et.al. (2020). Making the most of video recorded clinical encounters: Optimizing impact and productivity through interdisciplinary teamwork. *Patient Education and Counseling*, 103(10), 2178–2184. https://doi.org/10.1016/j.pec.2020.06.005

Henton, C. G., (1986). Creak as a sociophonetic marker. *The Journal of the Acoustical Society of America*, *80*(S1), S50–S50.

Heritage, J., & Maynard, D. W. (2006). *Communication in medical care: Interaction between primary care physicians and patients* (Vol. 20). Cambridge University Press.

Higgins, C. (2010). Discursive enactments of the World Health Organization's policies: Competing cultural models in Tanzanian HIV/AIDS prevention. Language Policy, 9(1), 65. https://doi.org/10.1007/s10993-009-9151-x

Hoffmann, D. E., & Tarzian, A. J. (2003). Achieving the right balance in oversight of physician opioid prescribing for pain: The role of state medical boards. *The Journal of Law, Medicine & Ethics*, *31*(1), 21–40.

Højsted, J. and Sjøgren, P. (2007) Addiction to opioids in chronic pain patients: a literature review. *European Journal of Pain* 11(5): 490–518.

Holman, H., & Lorig, K. (2000). Patients as partners in managing chronic disease: Partnership is a prerequisite for effective and efficient health care. *British Medical Journal*, *320*(7234), 526–527.

Hood-Medland, E. A., White, A. E., Kravitz, R. L., & Henry, S. G. (2021). Agenda setting and visit openings in primary care visits involving patients taking opioids for chronic pain. *BMC Family Practice*, 22(1), 1–11. https://doi.org/10.1186/s12875-020-01317-4

Hornberger, N. H. (1998). Language policy, language education, language rights: Indigenous, immigrant, and international perspectives. *Language in Society*, 27(4), 439–458.

Hornberger, N. H. (2006). Frameworks and models in language policy and planning. *An Introduction to Language Policy: Theory and Method*, 24–41.

Hornberger, N. H., & Johnson, D. C. (2007). Slicing the onion ethnographically: Layers and spaces in multilingual language education policy and practice. *Tesol Quarterly*, *41*(3), 509–532.

Hughes, H. K., Korthuis, P. T., Saha, S., et al. (2015) A mixed methods study of patient–provider communication about opioid analgesics. *Patient education and counseling* 98(4): 453–461. https://doi.org/10.1016/j.pec.2014.12.003

Hult, F. M. (2010). Analysis of language policy discourses across the scales of space and time. *International Journal of the Sociology of Language*, *2010*(202), 7–24.

Institute of Medicine. (1988). *The Future of Public Health*. https://doi.org/10.17226/1091

Irvine J (2001) 'Style' as distinctiveness: The culture and ideology of linguistic differentiation. In: Eckert P and Rickford JR (eds) *Style and Sociolinguistic Variation*. Cambridge, U.K.: Cambridge University Press, pp. 21–43.

Jefferson, G. (1990). List construction as a task and resource. *Interaction Competence*, *63*, 92.

Jiang, X., & Pell, M. D. (2017). The sound of confidence and doubt. *Speech Communication*, 88, 106–126. https://doi.org/10.1016/j.specom.2017.01.011

Johnson, D. C. (2013). Positioning the language policy arbiter: Governmentality and footing in the school district of Philadelphia. In *Language policies in education* (pp. 128–148). Routledge.

Johnson, D. C., & Freeman, R. (2010). Appropriating language policy on the local level: Working the spaces for bilingual education. In *Negotiating language policies in schools* (pp. 27–45). Routledge.

Johnson, E. J. (2012). Arbitrating repression: Language policy and education in Arizona. *Language and Education*, 26(1), 53–76. https://doi.org/10.1080/09500782.2011.615936

Johnstone, B. (2018). *Discourse analysis* (Vol. 3). John Wiley & Sons.

Keating, P., Garellek, M. & Kreiman, J. (2015) Acoustic properties of different kinds of creaky voice. In: *Proceedings of the 18th International Congress of Phonetic Sciences*, 2015, pp. 0821–1.

Klamen, D. L. (1999). Education and Training in Addictive Diseases. *Psychiatric Clinics of North America*, 22(2), 471–480. https://doi.org/10.1016/S0193-953X(05)70087-3

Kratzer, A. (2012). *Modals and conditionals: New and revised perspectives* (Vol. 36). Oxford University Press.

Kymlicka, W., & Patten, A. (2003). Language rights and political theory. *Annual Review of Applied Linguistics*, *23*, 3–21.

Labov, W. (1972). Some principles of linguistic methodology. *Language in Society*, *1*(1), 97–120.

Ladefoged, P. (1971). *Preliminaries to linguistic phonetics*. Chicago: University of Chicago Press.

Lakoff, R. (1973). Language and woman's place. *Language in Society*, *2*(1), 45–79.

Lee, D. (1987). The semantics of just. *Journal of Pragmatics*, 11(3), 377–398. https://doi.org/10.1016/0378- 2166(87)90138-X

Lefkowitz, D., & Sicoli, M. (2007). Creaky voice: Constructions of gender and authority in American English conversation. *106th Annual Meeting of the American Anthropological Association, Washington, DC* .

Levinson, B. A., Sutton, M., & Winstead, T. (2009). Education policy as a practice of power: Theoretical tools, ethnographic methods, democratic options. *Educational Policy*, *23*(6), 767–795.

Lian, J. (2020). Discourse of Congressional hearings. In *The Routledge Handbook of Corpus Approaches to Discourse Analysis* (pp. 136–151). Routledge.

Lipsky, M. (1971). Street-Level Bureaucracy and the Analysis of Urban Reform. *Urban Affairs Quarterly*, 6(4), 391–409. https://doi.org/10.1177/107808747100600401

Locher, M. A. (2011). Situated impoliteness: The interface between relational work and identity construction. *Situated Politeness*, 187–208.

Lutfey, K., & Maynard, D. W. (1998). Bad News in Oncology: How Physician and Patient Talk About Death and Dying Without Using Those Words. *Social Psychology Quarterly*, 61(4), 321–341. https://doi.org/10.2307/2787033

Lyons, J. (1977). *Semantics* (Vol. 2). Cambridge university press.

Martinez, G. A. (2008). Language-in-healthcare policy, interaction patterns, and unequal care on the US-Mexico border. *Language Policy*, *7*(4), 345–363.

Maryns, K. (2012). Multilingualism in legal settings. In *The Routledge handbook of multilingualism* (pp. 313–329). Routledge.

Matthias, M. S., Krebs, E. E., Collins, L. A. et al. (2013). "I'm Not Abusing or Anything": Patient–physician communication about opioid treatment in chronic pain. *Patient Education and Counseling*, *93*(2), 197–202.

McCarty, T. L. (1993). Federal language policy and American Indian education. *Bilingual Research Journal*, *17*(1–2), 13–34.

McCarty, T. L. (2014). *Ethnography and language policy*. Routledge.

McDouall, A. (2012). A corpus based investigation into the use of English modal auxiliaries by adult korean L2-learners. *Korea University Working Papers in Linguistics*, *6*, 33–44.

Mendoza-Denton, N. (2011). The semiotic hitchhiker's guide to creaky voice: Circulation and gendered hardcore in a Chicana/o gang persona. *Journal of Linguistic Anthropology*, *21*(2), 261–280.

Menken, K., & García, O. (2010). *Negotiating language education policies: Educators as policymakers*. Routledge.

Merrill, J. O., Rhodes, L. A., Deyo, R. A., et al. (2002). Mutual mistrust in the medical care of drug users. *Journal of General Internal Medicine*, 17(5), 327–333.

Miller, P., & Rose, N. (1990). Governing economic life. *Economy and Society*, *19*(1), 1–31.

Mishler, E. G. (1984). *The discourse of medicine: Dialectics of medical interviews* (Vol. 3). Greenwood Publishing Group.

Mistral, R., & Velleman, W. (2001). Substance-misusing Patients in Primary Care: Incidence, services provided and problems. A survey of general practitioners in Wiltshire. *Drugs: Education, Prevention and Policy*, 8(1), 61–72. https://doi.org/10.1080/09687630123912

Moisik, S. (2013) *The epilarynx in speech*. Doctoral Dissertation. University of Victoria, Victoria, BC, Canada.

Müller, N., & Guendouzi, J. A. (2005). Order and disorder in conversation: Encounters with dementia of the Alzheimer's type. *Clinical Linguistics & Phonetics*, *19*(5), 393–404. https://doi.org/10.1080/02699200400027213

National Center for Health Statistics. (2017). *Drug Overdose Deaths in the United States, 1999–2016* (No. 294; NCHS Data Brief, p. 8). National Center for Health Statistics.

Nolan, F. (2003). Intonational Equivalence: An Experimental Evaluation of Pitch Scales. In *ICPhS-15*, 771-774.

Noss, R. B. (1967). *Language policy and higher education*. Unesco and the International Association of Universities.

O'Driscoll, J. (2011). Some Issues with the Concept of Face: When, what, how and how much? In *Politeness across cultures* (pp. 17–41). Springer.

O'Halloran, K. L. (2011). Multimodal discourse analysis. *Continuum Companion to Discourse Analysis*, 120–137.

O'Malley, M-P. (2010). 'So either you have a foetal monitor or you have your waters broken, basically is it?': Articulating maternity care policy at a midwives' ante-natal clinic. *Language Policy*, *9*(1), 87. https://doi.org/10.1007/s10993-009-9152- 9

Ogden, R. (2006). Phonetics and social action in agreements and disagreements. *Journal of Pragmatics*, *38*(10), 1752–1775.

Omoniyi, T. (2012). Multilingualism and religion. In *The Routledge Handbook of Multilingualism* (pp. 363–381). Routledge.

Orpin, D. (2005). Corpus linguistics and critical discourse analysis: Examining the ideology of sleaze. *International Journal of Corpus Linguistics*, *10*(1), 37–61.

Patrick, D. (2012). Indigenous contexts. *The Routledge Handbook of Multilingualism*, 29–48.

Pérez, B., & Nordlander, A. (2004). Making decisions about literacy instructional practices. *Sociocultural Contexts of Language and Literacy*, *2*, 277–308.

Podesva, R. J. (2007). Phonation type as a stylistic variable: The use of falsetto in constructing a persona. *Journal of Sociolinguistics*, *11*(4), 478–504.

Portner, P. (2009). *Modality* (Vol. 1). Oxford University Press.

Quirk, R., Greenbaum, S., Leech, G., & Svartoik, J. (1985). *A Comprehensive grammar of the English language*. Longman.

Ramanathan, V. (2005). Situating the researcher in research texts: Dilemmas, questions, ethics, new directions. *Journal of Language, Identity, and Education*, *4*(4), 291–293.

Ramanathan, V. (2009). *Bodies and language: Health, ailments, disabilities*. Multilingual Matters.

Ramanathan, V. (2010). Introduction to thematic issue: Language policies and health. *Language Policy*, 9(1), 1–7. https://doi.org/10.1007/s10993-009-9154-7

Ramanathan, V. (2013). *Language policies and (dis) citizenship: Rights, access, pedagogies*. Multilingual Matters.

Ramanathan, V., & Morgan, B. (2007). TESOL and policy enactments: Perspectives from practice. *Tesol Quarterly*, *41*(3), 447–463.

Ricento, T. K. (2000). *Ideology, politics and language policies: Focus on English* (Vol. 6). John Benjamins Publishing.

Ricento, T. K. (2009). *An introduction to language policy: Theory and method*. John Wiley & Sons.

Ricento, T. K., & Hornberger, N. H. (1996). Unpeeling the onion: Language planning and policy and the ELT professional. *Tesol Quarterly*, *30*(3), 401–427.

Roberts, C., & Sarangi, S. (2005). Theme-oriented discourse analysis of medical encounters. *Medical Education*, *39*(6), 632–640.

Roberts, F., & Kramer, J. S. (2014). Medication and morality: Analysis of medical visits to address chronic pain. In H. Hamilton & W. S. Chou (Eds.), *The Routledge Handbook of Language and Health Communication* (pp. 477–489). Rouletge.

Robinson, J. D. (2001) Asymmetry in action: Sequential resources in the negotiation of a prescription request. *Text–Interdisciplinary Journal for the Study of Discourse* 21(1–2): 19–54.

Rundblad, G. (2007). Impersonal, General, and Social: The Use of Metonymy Versus Passive Voice in Medical Discourse. *Written Communication*, 24(3), 250–277. https://doi.org/10.1177/0741088307302946

Sabat, S. R. (1991). Turn-taking, turn-giving, and Alzheimer's disease: A case study of conversation. *Georgetown Journal of Languages and Linguistics*, *2*(2), 161–75.

Sabat, S. R. (2006). 18 Mind, meaning, and personhood in dementia: the effects of positioning. *Dementia Mind, Meaning, and the Person*, 287.

Sabatier, P., & Mazmanian, D. (1980). The implementation of public policy: A framework of analysis. *Policy Studies Journal*, 8(4), 538–560. https://doi.org/10.1111/j.1541-0072.1980.tb01266.x

Sacks, H., Schegloff, E. A., & Jefferson, G. (1978). A simplest systematics for the organization of turn taking for conversation. In *Studies in the organization of conversational interaction* (pp. 7–55). Elsevier.

Saeed, J. I. (1997). *Semantics*. Oxford; Malden, Mass.: Blackwell Publishers.

Sarangi, S., & Roberts, C. (2008). *Talk, work and institutional order: Discourse in medical, mediation and management settings* (Vol. 1). Walter de Gruyter.

Schiffrin, D. (1994). Making a list. *Discourse Processes*, 17(3), 377–406. https://doi.org/10.1080/01638539409544875

Schilling-Estes, N. (1998). Investigating "self-conscious" speech: The performance register in Ocracoke English. *Language in Society*, *27*(1), 53–83.

Schrauf, R. W., & Müller, N. (2013). Conversation as Cognition: Reframing Cognition in Dementia nicole müller and robert w. schrauf. In *Dialogue and Dementia* (pp. 15–38). Psychology Press.

Schuster, M., Elroy, I., & Elmakais, I. (2017). We are lost: Measuring the accessibility of signage in public general hospitals. *Language Policy,* 16(1), 23–38. https://doi.org/10.1007/s10993-015-9400-0

Searle, J. R. (1969). *Speech acts: An essay in the philosophy of language* (Vol. 626). Cambridge university press.

Seelye, K. Q. (2018). 1 Son, 4 Overdoses, 6 Hours. The New York Times. https://www.nytimes.com/2018/01/21/us/opioid- addiction-treatment-families.html

Sehgal, N., Manchikanti, L., & Smith, H. (2012). Prescription Opioid Abuse in Chronic Pain:A Review of Opioid Abuse Predictors andStrategies to Curb Opioid Abuse. *Pain Physician*, 3S;15(3S;7), S67-ES92. https://doi.org/10.36076/ppj.2012/15/ES67

Shaw, S., & Bailey, J. (2009). Discourse analysis: What is it and why is it relevant to family practice? *Family Practice*, 26(5), 413–419. https://doi.org/10.1093/fampra/cmp038

Shohamy, E. (2006). *Language policy: Hidden agendas and new approaches*. Routledge.

Sifianou, M., & Tzanne, A. (2021). Face, Facework and Face-Threatening Acts. In D. Z. Kádár, M. Terkourafi, & M. Haugh (Eds.), *The Cambridge Handbook of Sociopragmatics* (pp. 249–271). Cambridge University Press. https://doi.org/10.1017/9781108954105.015

Speaks, C. E. (2017). *Introduction to sound: Acoustics for the hearing and speech sciences*. Plural Publishing.

Spencer-Oatey, H. (Ed.). (2006). *Culturally speaking: Managing rapport through talk across cultures* (Repr). Continuum.

Spiers, J. A. (1998). The Use of Face Work and Politeness Theory. *Qualitative Health Research*, 8(1), 25–47. https://doi.org/10.1177/104973239800800103

Stivers, T. (2002). Participating in decisions about treatment: Overt parent pressure for antibiotic medication in pediatric encounters. *Social Science & Medicine*, 54(7), 1111–1130. https://doi.org/10.1016/S0277-9536(01)00085-5

Stivers, T., & Timmermans, S. (2017). Always Look on the Bright Side of Life: Making Bad News Bivalent. *Research on Language and Social Interaction*, 50(4), 404–418. https://doi.org/10.1080/08351813.2017.1375804

Strauss, A. L. (1987). *Qualitative analysis for social scientists*. Cambridge university press.

Strauss, A. L., & Corbin, J. M. (1997). *Grounded theory in practice*. Sage.

Stritikus, T., & Wiese, A. (2006). Reassessing the role of ethnographic methods in education policy research: Implementing bilingual education policy at local levels. *Teachers College Record*, *108*(6), 1106–1131.

Stubbs, M. (1996). *Text and Corpus Analysis: Computer Assisted Studies of Language and Culture*. Oxford, United Kingdom: John Wiley and Sons Ltd.

Stubbs, M. (2001). *Words and phrases: Corpus studies of lexical semantics*. Blackwell publishers Oxford.

Sullivan, M. and Ferrell, B. (2005) Ethical challenges in the management of chronic nonmalignant pain: negotiating through the cloud of doubt. *The Journal of Pain* 6(1): 2–9.

Sweetser, E. (1990). *From etymology to pragmatics: metaphorical and cultural aspects of semantic structure*. Cambridge [England]; New York: Cambridge University Press.

Talmy, L. (1988). Force dynamics in language and cognition. *Cognitive Science*, *12*(1), 49–100.

Tannen, D. (2007). *Talking Voices: Repetition, Dialogue, and Imagery in Conversational Discourse*. Cambridge University Press.

Tannen, D., & Wallat, C. (1987). Interactive frames and knowledge schemas in interaction: Examples from a medical examination/interview. *Social Psychology Quarterly*, *50*(2), 205–216.

Terkourafi, M. (2012). Politeness and pragmatics. In K. Allan & K. M. Jaszczolt (Eds.), *The Cambridge Handbook of Pragmatics* (pp. 617–637). Cambridge University Press. https://doi.org/10.1017/CBO9781139022453.034

Thakur, T., Frey, M., & Chewning, B. (2021). Communication between patients and health care professionals about opioid medications. *Exploratory Research in Clinical and Social Pharmacy*, 100030. https://doi.org/10.1016/j.rcsop.2021.100030

Thompson, P. (2001). *A pedagogically-motivated corpus-based examination of PhD theses: Macrostructure, citation practices and uses of modal verbs*. Reading, UK: University of Reading.

Tollefson, J. W. (1991). *Planning language, planning inequality: Language policy in the community*. London ; New York: Longman.

Tollefson, J. W. (2002). *Language policies in education: Critical issues*. Psychology Press.

Tollefson, J. W. (2006). Critical theory in language policy. *An Introduction to Language Policy: Theory and Method*, *1*, 42–59.

Torreira, F., & Grice, M. (2018). Melodic constructions in Spanish: Metrical structure determines the association properties of intonational tones. *Journal of the International Phonetic Association*, *48*(1), 9–32.

Torres, P. J. (2021). The role of modals in policies: The US opioid crisis as a case study. *Applied Corpus Linguistics*, 1(3), 1–17. https://doi.org/10.1016/j.acorp.2021.100008

Torres, P. J., Henry, S. G, & Ramanathan, V. (2020). Let's talk about pain and opioids: Low pitch and creak in medical consultations. *Discourse Studies*. https://doi.org/10.1177/1461445619893796

Truesdale, D. M., & Pell, M. D. (2018). The sound of Passion and Indifference. *Speech Communication*, 99, 124–134. https://doi.org/10.1016/j.specom.2018.03.007

Tseregounis, I. E., Gasper, J. J., & Henry, S. G. (2021). Trends in buprenorphine to treat opioid use disorder in California, 2012 to 2018: Medicaid outpaces the rest of the state. *Journal of Addiction Medicine*, *15*(5), 425–428.

Turk, D. C. & Okifuji, A. (1997) What factors affect physicians' decisions to prescribe opioids for chronic noncancer pain patients? *The Clinical journal of pain* 13(4): 330–336.

van Boekel, L. C., Brouwers, E. P. M., van Weeghel, J. et al. (2013). Stigma among health professionals towards patients with substance use disorders and its consequences for healthcare delivery: Systematic review. *Drug and Alcohol Dependence*, 131(1), 23–35. https://doi.org/10.1016/j.drugalcdep.2013.02.018

Van Dijk, T. A. (1985). Handbook of discourse analysis. *Discourse and Dialogue*.

Van Dijk, T. A. (1999). Context models in discourse processing. *The Construction of Mental Representations during Reading*, 123–148.

Van Dijk, T. A. (2011) *Discourse as Structure and Process*. Reprinted. Discourse studies a multidisciplinary introduction / ed. by Teun A. van Dijk; Vol. 1. London: SAGE.

Ward, N. (2006). Non-lexical conversational sounds in American English. *Pragmatics & Cognition*, 14(1), 129–182. https://doi.org/10.1075/pc.14.1.08war

Ward, N. G. (2019). *Prosodic patterns in English conversation*. Cambridge University Press.

Watts, R. J. (2003). *Politeness*. Cambridge University Press.

Werth, P. (1999). *Text worlds: representing conceptual space in discourse*. Harlow: Longman.

Wilce, J. M. (1997). Discourse, power, and the diagnosis of weakness: Encountering practitioners in Bangladesh. *Medical Anthropology Quarterly*, *11*(3), 352–374.

Wiley, T. G., & Wright, W. E. (2004). Against the undertow: Language-minority education policy and politics in the "age of accountability." *Educational Policy*, *18*(1), 142–168.

Wilkinson, S., & Kitzinger, C. (2000). Thinking differently about thinking positive: A discursive approach to cancer patients' talk. *Social Science & Medicine*, *50*(6), 797–811.

Appendix A: Restrictive and permissive modal phrases (Chapter 3)

Legend:

BPC	Business and Professions Code	**INS**	Insurance Code
CIV	Civil Code	**LAB**	Labor Code
EDC	Education Code	**PEN**	Penal Code
HSC	Health and Safety Code	**WIC**	Welfare and Institutions Code

Table Format:

California Policy Code	Year	Word Count	Restrictive Phrases	Permissive Phrases
Original	**Y_1**	**n**	**X**	**Y**
$Amendment_1$	Y_1	n_1	ΔX	ΔY
$Amendment_2$	Y_2	n_3	ΔX_1	ΔY_1
$Amendment_3$	Y_3	n_3	ΔX_2	ΔY_2

California Policy Code	Year	Word Count	Restrictive Phrases	Permissive Phrases
BPC 1645	**1994**	**247**	**3**	**3**
BPC 1645	2013	366	+4	0
BPC 1645	2018	329	+2	-1
BPC 1645	2018	330	0	0
BPC 208	**2013**	**384**	**5**	**1**
BPC 208	2016	476	+1	0
BPC 209	**2013**	**183**	**2**	**0**
BPC 2190.5	**2001**	**165**	**4**	**2**
BPC 2190.5	2003	173	0	0
BPC 2190.5	2018	210	+1	0
BPC 2191	**1990**	**279**	**7**	**2**
BPC 2191	1993	367	+2	0
BPC 2191	1996	427	+1	0
BPC 2191	1998	447	+1	0
BPC 2191	2014	468	+1	0
BPC 2191	2017	484	0	0

California Policy Code	Year	Word Count	Restrictive Phrases	Permissive Phrases
HSC 11165.1	**2002**	**255**	**3**	**3**
HSC 11165.1	2003	217	-1	0
HSC 11165.1	2006	221	0	0
HSC 11165.1	2011	494	+2	+4
HSC 11165.1	2013	600	+5	-4
HSC 11165.1	2015	600	0	0
HSC 11165.1	2016	670	-1	0
HSC 11165.1	2017	1459	+5	+5
HSC 11165.1	2019	1487	+2	0
HSC 11165.2	**2011**	**810**	**18**	**11**
HSC 11165.3	**2011**	**78**	**1**	**2**
HSC 11165.3	2012	74	0	0
HSC 11165.4	**2016**	**1156**	**9**	**0**
HSC 11165.5	**2013**	**350**	**2**	**2**
HSC 11165.6	**2018**	**28**	**1**	**0**
HSC 11166	**1998**	**77**	**2**	**0**

BPC 2191	2018	497	0	0
BPC 2196.2	**1998**	**61**	**2**	**0**
BPC 2196.2	2018	74	0	0
BPC 2196.8	**2013**	**106**	**2**	**0**
BPC 2241.5	**1990**	**544**	**7**	**1**
BPC 2241.5	1994	555	0	0
BPC 2241.5	2004	555	0	0
BPC 2241.5	2006	469	-1	0
BPC 2241.5	2015	476	0	0
BPC 2454.5	**1989**	**73**	**2**	**0**
BPC 2454.5	1994	164	+1	0
BPC 2454.5	2017	180	+2	0
BPC 2454.5	2018	202	+1	0
BPC 2746.51	**1991**	**616**	**11**	**2**
BPC 2746.51	2001	1140	+6	+1
BPC 2746.51	2002	1111	-1	0
BPC 2746.51	2005	1214	+2	0
BPC 2746.51	2012	1221	0	+1
BPC 2746.51	2018	1236	0	0
BPC 2836.1	**1991**	**471**	**8**	**2**
BPC 2836.1	1996	591	+3	+1
BPC 2836.1	1999	754	+3	0
BPC 2836.1	2002	724	-1	0
BPC 2836.1	2003	837	+2	0
BPC 2836.1	2004	812	0	0
BPC 2836.1	2012	816	0	+1
BPC 2836.1	2018	825	0	0
BPC 2836.4	**2017**	**267**	**1**	**0**
BPC 3059	**1987**	**191**	**1**	**2**
BPC 3059	2000	428	+6	+2
BPC 3059	2004	420	0	0
BPC 3059	2018	394	-1	-1
BPC 3502.1	**1994**	**571**	**9**	**7**
BPC 3502.1	2000	817	+6	0
BPC 3502.1	2004	875	+1	0
BPC 3502.1	2007	1097	+5	0
BPC 3502.1	2012	1101	0	0
BPC 3502.1	2015	1333	+5	-1

HSC 11166	2003	74	0	0
HSC 11167	**1994**	**284**	**6**	**2**
HSC 11167	1998	205	-3	0
HSC 11167	1999	205	0	0
HSC 11167	2003	218	+1	0
HSC 11167	2012	232	0	0
HSC 11167.5	**1988**	**400**	**8**	**1**
HSC 11167.5	1993	363	0	0
HSC 11167.5	1994	371	0	0
HSC 11167.5	2003	304	-2	0
HSC 11220	**1995**	**29**	**1**	**0**
HSC 11220	2017	50	0	0
HSC 11453	**1980**	**174**	**3**	**2**
HSC 11601	**2014**	**174**	**3**	**1**
HSC 11756. 5	**2019**	**200**	**4**	**0**
HSC 1179.80	**2016**	**215**	**2**	**2**
HSC 11839.1	**2004**	**88**	**0**	**0**
HSC 11839.1	2013	88	0	0
HSC 11839.1	2017	96	0	0
HSC 11839.2	**2004**	**39**	**0**	**0**
HSC 11839.2	2012	76	0	0
HSC 11839.2	2013	76	0	0
HSC 11839.2	2017	147	+1	+1
HSC 11839.22	**2004**	**20**	**1**	**0**
HSC 11839.22	2014	22	0	0
HSC 11839.24	**2004**	**40**	**1**	**0**
HSC 11839.24	2014	40	0	0
HSC 11839.3	**2004**	**1133**	**27**	**6**
HSC 11839.3	2013	1142	0	0
HSC 11839.3	2014	1205	+2	0
HSC 11839.3	2017	1219	+1	-1
HSC 11839.5	**2004**	**109**	**2**	**2**
HSC 11839.5	2013	109	0	0
HSC 11839.5	2017	123	0	0
HSC 11839.6	**2004**	**513**	**7**	**4**
HSC 11839.6	2017	528	0	0
HSC 11849	**2004**	**72**	**2**	**2**
HSC 11849.5	**2004**	**187**	**5**	**1**

BPC 3502.1	2018	1342	0	0
BPC 3502.1.5	**2017**	**296**	**1**	**1**
BPC 3502.1.5	2018	296	0	0
BPC 4052.01	**2014**	**427**	**6**	**2**
BPC 4052.10	**2017**	**365**	**11**	**2**
BPC 4052.11	**2019**	**50**	**1**	**0**
BPC 4076.7	**2018**	**71**	**1**	**0**
BPC 4106.5	**2018**	**339**	**5**	**1**
BPC 4113.5	**2018**	**442**	**4**	**1**
BPC 4119.8	**2016**	**179**	**2**	**1**
BPC 740	**2018**	**42**	**0**	**0**
BPC 741	**2018**	**289**	**1**	**0**
BPC 742	**2018**	**95**	**1**	**0**
CIV 1714.22	**2007**	**395**	**4**	**1**
CIV 1714.22	2010	492	+1	+1
CIV 1714.22	2013	524	+1	+1
CIV 1798.24	**1987**	**1035**	**6**	**2**
CIV 1798.24	1992	962	0	0
CIV 1798.24	1995	974	0	0
CIV 1798.24	2005	1368	+1	+1
CIV 1798.24	2006	1359	0	+1
CIV 1798.24	2008	1360	0	0
CIV 1798.24	2010	1464	+2	0
CIV 1798.24	2014	1473	+1	-1
CIV 1798.24	2018	1506	-1	0
EDC 49414.3	**2016**	**1662**	**24**	**11**
EDC 49476	**2018**	**153**	**2**	**1**
HSC 11158.1	**2018**	**284**	**2**	**0**
HSC 11158.1	2019	500	+4	**0**
HSC 11161.5	**2003**	**756**	**11**	**6**
HSC 11161.5	2005	990	+6	-1
HSC 11161.5	2011	1399	+8	-1
HSC 11161.5	2018	1484	+1	+2
HSC 11161.7	**2003**	**121**	**2**	**0**
HSC 11162.1	**2003**	**516**	**17**	**1**
HSC 11162.1	2007	672	+3	+2
HSC 11162.1	2011	729	+1	+1
HSC 11162.1	2018	786	-1	0

HSC 11852.5	**2004**	**646**	**25**	**1**
HSC 11852.5	2012	848	+5	+3
HSC 11857	**2019**	**193**	**2**	**1**
HSC 11857. 02	**2019**	**224**	**2**	**0**
HSC 11857. 03	**2019**	**180**	**2**	**1**
HSC 11857. 08	**2019**	**71**	**2**	**0**
HSC 11876	**2012**	**50**	**1**	**0**
HSC 124236	**2018**	**176**	**4**	**1**
HSC 124960	**1997**	**383**	**1**	**3**
HSC 124960	2011	356	0	0
HSC 124961	**1997**	**383**	**4**	**3**
HSC 124961	2011	356	0	0
HSC 1254.7	**1999**	**99**	**3**	**0**
HSC 1254.7	2017	82	0	0
HSC 1367.43	**2017**	**53**	**2**	**0**
HSC 1371.1	**1989**	**173**	**4**	**0**
HSC 1371.1	1992	173	0	0
HSC 1371.1	2008	386	+6	0
HSC 1371.1	2009	392	0	0
HSC 1371.1	2017	438	+1	0
HSC 1797.170	**1989**	**113**	**4**	**0**
HSC 1797.170	2008	122	0	0
HSC 1797.170	2014	235	+3	0
HSC 1797.170	2018	510	+4	+1
HSC 1797.197	**2001**	**64**	**2**	**0**
HSC 1797.197	2014	295	+3	+3
INS 10123.145	**1989**	**170**	**4**	**0**
INS 10123.145	2008	368	+6	0
INS 10123.145	2009	372	0	0
INS 10123.145	2017	418	+1	0
INS 10123.203	**2017**	**48**	**2**	**0**
LAB 5307.27	**2003**	**82**	**3**	**0**
LAB 5307.27	2015	183	+4	0
LAB 5307.27	2016	290	+4	0
LAB 5307.28	**2015**	**108**	**2**	**0**
LAB 5307.29	**2015**	**413**	**11**	**1**
PEN 1001.85	**2016**	**180**	**3**	**0**
PEN 1001.86	**2016**	**239**	**5**	**0**

HSC 11162.5	**2006**	**117**	**2**	**0**
HSC 11162.5	2011	128	0	0
HSC 11162.6	**2003**	**203**	**5**	**0**
HSC 11164	**1988**	**785**	**21**	**5**
HSC 11164	1991	782	0	0
HSC 11164	1994	787	0	0
HSC 11164	2000	857	+1	+1
HSC 11164	2002	860	0	0
HSC 11164	2003	438	-10	-3
HSC 11164	2005	469	+1	0
HSC 11164	2006	506	0	0
HSC 11164.1	**2003**	**154**	**2**	**2**
HSC 11164.1	2013	146	+1	0
HSC 11164.1	2019	157	+1	0
HSC 11165	**2003**	**489**	**8**	**3**
HSC 11165	2006	575	0	0
HSC 11165	2011	612	0	0
HSC 11165	2013	797	+2	+2
HSC 11165	2016	900	+1	+1
HSC 11165	2018	1314	+6	+4
HSC 11165	2018	1315	0	0
HSC 11165	2019	1471	+5	0

PEN 1001.87	**2016**	**592**	**5**	**4**
PEN 1001.88	**2016**	**389**	**3**	**5**
PEN 2694.5	**2016**	**388**	**6**	**0**
WIC 14021.37.	**2019**	**283**	**4**	**1**
WIC 14124.14	**2018**	**387**	**8**	**1**
WIC 14197	**2017**	**2311**	**26**	**7**
WIC 14197	2018	2243	0	0
WIC 14197	2019	2456	+2	+1
WIC 3300	**2005**	**269**	**8**	**2**
WIC 3303	**1985**	**242**	**6**	**3**
WIC 3305	**1985**	**81**	**0**	**1**
WIC 3306	**1971**	**122**	**1**	**4**
WIC 3307	**1971**	**21**	**0**	**1**
WIC 3309	**2005**	**37**	**1**	**0**
WIC 3310	**1971**	**35**	**0**	**1**
WIC 3311	**1971**	**35**	**0**	**1**
WIC 5848.51	**2016**	**987**	**13**	**8**

Total per year:

Year	Restrictive Phrases	Permissive Phrases	Year	Restrictive Phrases	Permissive Phrases
1971	1	7	**2002**	1	3
1980	3	2	**2003**	38	9
1985	6	4	**2004**	71	16
1987	7	4	**2005**	19	2
1988	29	6	**2006**	1	1
1989	14	0	**2007**	12	3
1990	14	3	**2008**	12	0
1991	19	4	**2009**	0	0
1992	0	0	**2010**	3	1

1993	2	0	**2011**	30	17
1994	19	12	**2012**	6	5
1995	1	0	**2013**	24	2
1996	4	1	**2014**	19	5
1997	5	6	**2015**	22	0
1998	2	0	**2016**	77	32
1999	6	0	**2017**	54	15
2000	13	3	**2018**	41	10
2001	12	3	**2019**	31	4
2002	1	3	Total	618	180

Appendix B: Statistical Analyses (Chapter 3)

Regression results between time and number of restrictive phrases

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.469[a]	.220	.197	17.15300

a. Predictors: (Constant), Year

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	2825.334	1	2825.334	9.603	.004[b]
	Residual	10003.666	34	294.225		
	Total	12829.000	35			

a. Dependent Variable: Restrictive

b. Predictors: (Constant), Year

Coefficients[a]						
Model		**Unstandardized Coefficients (B)**	**Std. Error**	**Standardized Coefficients (β)**	**t**	**Sig.**
1	(Constant)	-1530.795	499.543		-3.064	.004
	Year	.774	.250	.469	3.099	.004

a. Dependent Variable: Restrictive

Regression results between time and number of permissive phrases

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.281[a]	.079	.052	6.40435

a. Predictors: (Constant), Year

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	119.467	1	119.467	2.913	.097[b]
	Residual	1394.533	34	41.016		
	Total	1514.000	35			

a. Dependent Variable: Permissive

b. Predictors: (Constant), Year

Coefficients[a]						
Model		**Unstandardized Coefficients (B)**	**Std. Error**	**Standardized Coefficients (β)**	**t**	**Sig.**
1	(Constant)	-313.309	186.512		-1.680	.102
	Year	.159	.093	.281	1.707	.097

a. Dependent Variable: Permissive

Regression results between fatal cases and number of restrictive phrases

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.427[a]	.182	.157	17.693

a. Predictors: (Constant), Fatal_Cases

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	2301.580	1	2301.580	7.352	.011[b]
	Residual	10330.591	33	313.048		
	Total	12632.171	34			

a. Dependent Variable: Restrictive

b. Predictors: (Constant), Fatal_Cases

Coefficients[a]						
Model		**Unstandardized Coefficients (B)**	**Std. Error**	**Standardized Coefficients (β)**	**t**	**Sig.**
1	(Constant)	3.199	5.831		.549	.587
	Fatal_Cases	.012	.004	.427	2.711	.011

a. Dependent Variable: Restrictive

Regression results between fatal cases and number of permissive phrases

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.299[a]	.089	.062	6.462

a. Predictors: (Constant), Fatal_Cases

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	135.130	1	135.130	3.236	.081[b]
	Residual	1377.841	33	41.753		
	Total	1512.971	34			

a. Dependent Variable: Permissive

b. Predictors: (Constant), Fatal_Cases

Coefficients[a]						
Model		**Unstandardized Coefficients (B)**	**Std. Error**	**Standardized Coefficients (β)**	**t**	**Sig.**
1	(Constant)	1.740	2.129		.817	.420
	Fatal_Cases	.003	.002	.299	1.799	.081

a. Dependent Variable: Permissive

Regression results of time and number of stricter amendments

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.649[a]	.421	.392	1.119

Predictors: (Constant), Years

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	18.217	1	18.217	14.541	.001[b]
	Residual	25.056	20	1.253		
	Total	43.273	21			

a. Dependent Variable: Stricter_Amendment

b. Predictors: (Constant), Years

Coefficients[a]						
Model		**Unstandardized Coefficients (B)**	**Std. Error**	**Standardized Coefficients (β)**	**t**	**Sig.**
1	(Constant)	-227.495	60.232		-3.777	.001
	Years	.114	.030	.649	3.813	.001

a. Dependent Variable: Stricter_Amendment

Regression results of time and number of more lenient amendments

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.224[a]	.050	-.085	.737

a. Predictors: (Constant), Years

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	.201	1	.201	.370	.562[b]
	Residual	3.799	7	.543		
	Total	4.000	8			

a. Dependent Variable: More_Lenient

b. Predictors: (Constant), Years

Coefficients[a]						
Model		**Unstandardized Coefficients (B)**	**Std. Error**	**Standardized Coefficients (β)**	**t**	**Sig.**
1	(Constant)	48.271	76.566		.630	.548
	Year	-.023	.038	-.224	-.609	.562

a. Dependent Variable: More_Lenient

Mahalanobis Distance

D2 was calculated for each observation and their associated probability was conducted with chi-square ($\chi 2$). The probability shows that only two cases are significant at .01 level, which means outliers are not a big problem in this study.

Case	Mahalanobis Distance (*D2*)	P value
1	3.9391	0.14
2	0.62676	0.73
3	0.69183	0.71
4	0.54776	0.76
5	0.79757	0.67
6	1.26938	0.53
7	0.11653	0.94
8	0.18053	0.91
9	0.80489	0.67
10	0.66178	0.72
11	3.11252	0.21
12	0.7246	0.7
13	0.47758	0.79
14	1.87848	0.39
15	0.66178	0.72
16	0.58502	0.75
17	0.09628	0.95
18	0.09348	0.95

Case	Mahalanobis Distance (*D2*)	P value
19	1.21477	0.54
20	1.46068	0.48
21	9.29489	0.01
22	0.92665	0.63
23	0.74008	0.69
24	0.09348	0.95
25	0.99356	0.61
26	0.80489	0.67
27	0.54762	0.76
28	5.59924	0.06
29	1.08831	0.58
30	1.93678	0.38
31	0.02934	0.99
32	3.0709	0.22
33	17.1007	0.00
34	3.71915	0.16
35	1.7862	0.41
36	2.3269	0.31

Appendix C: Additional examples of policy actions (Chapter 3)

(A) General policies on handling pain: Propositions discussing pain and its relief.

Health care provider: This includes the procedures medical staff could take in the actual treatment of pain, including gathering pain as a vital sign or affirmation that opioids can be prescribed for chronic pain.

> *"Every health facility licensed pursuant to this chapter shall, as a condition of licensure, include pain as an item to be assessed at the same time as vital signs are taken."* 1999 Health and Safety Code 1254.7

> *"A physician and surgeon may prescribe or administer controlled substances to a person ... for a diagnosed condition causing intractable pain."* 1990 Business and Professions Code 2241.5

State department: Making sure that pain needs are met.

> *"Department of Justice shall maintain for three years a written, readily retrievable record identifying (1) the prescriber; (2) the name, strength, and quantity of the controlled substance dispensed; (3) the circumstances under which the emergency prescription was filled."* 1994 Health and Safety Code 11167

(B) Prescribing guidelines for controlled substances: Includes all the precautions and requirements needed before an opioid is prescribed.

Heath care provider: Checking/maintenance of prescription monitoring program, procedures in printing and filling up prescription forms, conditions pharmacists follow upon dispensing opioids, etc.

> *"A health care practitioner or a pharmacist... shall submit an application developed by the Department of Justice to obtain approval to access information stored on the Internet regarding the controlled substance history of a patient maintained within the Department of Justice, and the department shall release to that practitioner or pharmacist."* 2013 Health and Safety Code 11165.1

State department: Setting up licensing requirements and procedures, formularies and medication schedule.

> *"The Department of Justice …shall Identify and implement a streamlined application and approval process to provide access to the CURES Prescription Drug Monitoring Program (PDMP) database for licensed health care practitioners…"* 2003 Business and Profession Code 209

(C) Training/education requirements: Everything that involves learning, including mandatory training for health care personnel on opioid medications and its risks.

Health care providers: Taking mandatory classes in order to renew licenses. Training of physician assistants, nursing, paramedics, etc.

> *"All physicians and surgeons shall complete a mandatory continuing education course in the subjects of pain management and the treatment of terminally ill and dying patients"* 2001 Business and Professions Code 2190.5

State department: making sure practitioners are up to speed with new medical findings or deciding the "continuing education" classes providers have to take so they can keep their license.

> *"The board may prescribe this mandatory coursework within the general areas ... the risks of addiction associated with the use of Schedule II drugs."* 2018 Business and Professions Code 1645

(D) Oversight: Policies intended for oversight, which includes discussions about malpractice and possible license suspension.

State department: responsibilities in making sure policies are enacted at the local level.

> *"The board shall adopt regulations providing for the suspension of the licenses at the end of the two-year period until compliance with the assurances provided for in this section is accomplished."* 1994 Business and Professions Code 1645

(E) Treatment of substance abuse/ diversion: Includes all actions that are specifically intended to approach substance abuse problem.

State department: includes information dissemination on prevention as well as establishing and funding diversion treatment programs

> *"The department shall ...license the establishment of narcotic treatment programs in this state to use replacement narcotic therapy in the treatment of addicted persons."* 2004 Health and Safety Code 11839.3

Health care providers: consists of policies discussing the actual treatment of addiction.

> *"At the end of 30 days from the first treatment, the prescribing or furnishing of controlled substances, except medications approved by the federal Food and Drug Administration for the purpose of narcotic replacement treatment or medication-assisted treatment of substance use disorders, shall be discontinued."* 2017 Health and Safety Code 11220

Appendix D: Additional examples of modal amendments (Chapter 3)

The following examples show the change of modals in amendments. Italicized text indicate modal change while bolded text represent the rest of the changes between policies. The year in which the amendment took place is also noted.

Business and Professions Code 1645

1994

If the board determines that the public health and safety would be served by requiring all holders of licenses under this chapter to continue their education after receiving a license it ***may*** **require that they submit assurances** satisfactory to the board that they ***will*** **inform themselves**

2018

All holders of licenses under this chapter ***shall*** continue their education after receiving a license as a condition to the renewal thereof, and ***shall*** **obtain evidence** satisfactory to the board that they **have, during the preceding two-year period, obtained continuing education**

Health and Safety Code 11165.1

2002

A licensed health care practitioner eligible to **obtain triplicate prescription forms** or a pharmacist ***may*** make a written request for, and the Department of Justice ***may*** release to that practitioner or pharmacist, the history of controlled substances…

2003

A licensed health care practitioner eligible to **prescribe Schedule II or Schedule III controlled substances"** or a pharmacist ***may*** make a written request for, and the Department of Justice ***may*** release to that practitioner or pharmacist, the history of controlled substances …

2011 (Year the CDC declared the epidemic)

A health care practitioner or a pharmacist eligible to prescribe... ***may*** **provide a notarized application developed by the Department of Justice to obtain approval to access information stored on the Internet regarding the controlled substance history of a patient maintained within the Department of Justice,** and the department ***may*** **release to that practitioner or pharmacist** the history of controlled substances …

2013

A health care practitioner or a pharmacist eligible to prescribe... ***shall*** **submit an** application developed by the Department of Justice to obtain approval to access information stored on the Internet regarding the controlled substance history of a patient maintained within the Department of Justice, and, **upon approval,** the department ***shall*** release to that practitioner the **electronic** history of controlled substances …

Health and Safety Code 11165.5

2003

The department ***may*** revoke its approval of a security printer for a violation of this division or action that would permit a denial pursuant to subdivision (d) of this section.

2011 (Year the CDC declared the epidemic)

The department ***shall*** **impose restrictions against security printers who are not in compliance with this division pursuant to regulations implemented pursuant to this division and** (2) ***shall*** revoke its approval of a security printer for a violation of this division or action that would permit a denial pursuant to subdivision (d) of this section.

Business and Professions Code 3502.1

1994

A physician assistant ***may not*** administer, provide or transmit a prescription for Schedule II through Schedule V controlled substances without an order by a supervising physician and surgeon for the particular patient.

2017

A physician assistant ***shall not*** administer, provide, or transmit a prescription for Schedule II through Schedule V controlled substances without advance approval by a supervising physician and surgeon for that particular patient

Here is an example of the restrictive "shall not" switching to the permissive "may," which took place in 2001, when the main concern still revolved around solving the problem of pain undertreatment.

Business and Professions Code 2746.51

1991

Drugs or devices furnished by a certified nurse-midwife ***shall not*** include controlled substances under the California Uniform Controlled Substances Act…

2001

Drugs or devices furnished **or ordered** by a certified nurse-midwife ***may*** include **Schedule II** controlled substances under the California Uniform Controlled Substances Act…

Appendix E: Coding system (Chapter 5)

Coding manual
Chronic Pain and Opioids Project

Version 2.0 19 February 2020

Purpose:
To characterize patient utterances about chronic pain management and opioids during primary care visits. The larger analysis will revolve around vocal choices such as pitch, creak, and register shifting, among others.

This coding manual assists in pointing out the linguistic features used by patients to discuss opioids in light of the current crisis. This manual serves as a reference guide in the coding of speaking turns into various contextual categories based on the Chronic Pain Coding System (CPCS) developed by Henry *et al*. (2016). The CPCS focuses on the objective characterization of individual utterances involving pain and opioids, making it appropriate for this type of study. Adjustments were made to adapt the coding scheme to the specifics of this study.

While this list is not exhaustive of all the possibilities that can occur in a medical consult, the codes were developed (if not adapted from the CPCS) by the primary investigator as they emerged from the data during the initial read through. The goal is to accurately describe the turns by creating categories that fit them rather than forcing them into pre-determined ones (Strauss & Corbin, 1990). If you decide that none of these codes is a good fit for a particular turn, please mark them for discussion, which will be settled, together with other disagreements, during our post-individual coding conference.

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I. Transcribing process and unit of analysis

This study uses "speaking turns"—one or more utterances of a specific speaker **before another interlocutor mediates and converses**—as the unit of transcription/analysis. A speaker's turn, at the least, expresses a thought. An utterance by another speaker that is more extensive than a simple backchannel would typically signal a new speaking turn.

Segments of **overtalks** within turns (when more than one speaker talks at once) are excluded from the acoustic analysis since they do not provide for an accurate pitch analysis. **Backchannels** (such as uh-huh, okay, right) or short responses used by the listener to encourage the speaker to continue talking or signify active participation are transcribed but not analyzed for pitch.

As a rule of thumb, continue transcribing the main speaker's speech as one turn if the other speaker's backchannels do not interrupt the turn. For instance, Speaker A continued talking past Speaker B's backchannel; thus, the turn remained unrelinquished. Instead, add the backchannel on the following spreadsheet line introduced by an opened bracket "[". This keeps the transcript intonationally cohesive while also accounting for backchannels through coding. As mentioned, segments with overtalks will not be measured for pitch.

> Example of overlap *(The bracket denotes that the doctor's backchannelling overlapped with the patient's utterance of the word "opioids")*
>
> PAT: That was the time we decided that taking [opioids is the way to go.
> DOC: [Yeah

All patients in the study take opioids for chronic pain. Identify the opioids by referring to the list provided. To account for new brands and or names that are yet to be added to the list, conduct a web search of every medication mentioned as a second-level confirmation. The most prescribed opioid is Hydrocodone or acetaminophen (also known as Norco or Vicodin). Note that discussions of cough medication containing codeine ("codeine-guaifenesin," "Robitussin with codeine") does not count as opioid-related because they are used to treat cough rather than pain.

It is common for clinicians and patients not to mention the names of medications often when talking about them. (i.e., *"I took the pill in the morning because I have to go to work and did not want my shoulders hurting")*. If the name of the medication is not mentioned during a particular turn, use the context of the ongoing discussion and the medications mentioned in nearby turn to identify the drug being discussed.

II. Using this manual

This manual introduces the different codes used for the present study and their corresponding examples. **For the sake of providing specific examples, the chronic issue in all examples will be *"shoulder pain."***

How to code. In the transcript or coding file, enter the code in the cell right beside the speaking turn. The following example has a patient's turn, numbered 233, coded as an opioid request (R1).

233	PAT:	Could you refill my Norco?	R1					

This study will always have an odd number of coders to avoid draws. Each coder will code in a separate sheet to avoid priming each other. After everyone has coded, the coders will meet to finalize the coding and settle differences. In the rare case where all three coders selected distinct codes, each must make a case for their decision until an agreement/majority is reached. Options for turns with multiple parts will be discussed later in this manual.

III. Acute vs chronic pain

Clinicians often treat new pain ("acute pain") and long-term pain ("chronic pain") during the same visit. The present study distinguishes chronic pain treated by opioids from any other type of pain.

IV. Level 1 categories: pain and non-pain related

There are two general categories for patient utterances: (1) Pain-related and (2) Non-pain-related. Under pain-related are two major classifications: (a) "Chronic pain" or "opioid context" and (b) "other pain" or "non-opioid context."

Level 1 (General categories)	Level 2 (Specific contexts)
(A) Pain-related	(a) Chronic pain (Opioid context)
	(b) Other pain (Non-opioid context)
(B) Non-pain-related	(c) Non-pain

A. Pain-related utterances

Any utterance that discusses ongoing health conditions, such as any form of pain and its management (including non-pharmacological treatments like physical therapy, meditation, exercise), is pain-related, regardless of duration.

Misery and suffering. To distinguish general suffering and misery related to chronic pain from those caused by other types of pain could prove difficult. In fact, any pain, including relationship problems, all contribute to how patients perceive their chronic pain. The pragmatic solution would be for coders to make coding decisions based on the interaction context. When unsure, always follow the general rule: if the patient explicitly states that their misery relates to the pain they are feeling, then the turn is pain-related.

Here are some scenarios of when misery and suffering are "chronic pain-related":

- The patient states that they are miserable because their shoulders hurt all day.
- The patient's chronic pain costs them their job, and so the patient starts discussing how their chronic pain has contributed to their financial problems and misery.

Here are some scenarios of when misery and suffering fall under "other pain" but not "opioid or chronic-pain related":

- The patient expresses that they have been getting rashes since when a close friend has passed (and the patient explicitly claimed that the rashes are an acute problem unrelated to their chronic shoulder pain)
- The patient feels sicker after losing their job due to downsizing.

B. Non-pain-related

Utterances irrelevant to the patient's ongoing health conditions.

- The patient chose to pick up their medication from the CVS by X street instead of Y street.

V. Level 2 categories

A. Chronic pain (opioid context)

This category includes utterances involving patients' chronic problems managed by opioids. If the patient experiences chronic pain in multiple locations (or body parts), the opioid medication—being a pain killer narcotic—would more likely address all of them, which is why patients and physicians spend considerable time discussing opioids. For this study, chronic conditions that are not addressed with opioids do not fall under this category (i.e., Asthma, Psoriasis, and Diabetes, among others).

B. Other pain (non-opioid context)

This category includes turns about any acute pain or other chronic conditions not addressed by opioids, such as Eczema, Psoriasis, Diabetes, and asthma. Although challenging and often unbearable, the examples mentioned are not the usual chronic conditions addressed by opioids.

C. Non pain

This category includes discussions that are not about pain

VI. The codes

Each category is denoted by different upper case letters. The earlier discussed, CPCS heavily informs the codes in this manual. Specific edits were made to fit the current exploration.

Utterances can be multi-functional, and talk can perform multiple functions simultaneously. Therefore, a single turn can sometimes meet the criteria for two or (rarely) three categories. There are rules and caveats outlined in this manual for resolving issues in which turns could fall in more than one category.

A. Codes (by theme):

Requests (R_)
- Request for opioids (including implicit requests) (R1)
- Request for non-opioid medication (R2)
- Other Requests (R3)

Description or Narration of pain (D_)
- Description or Narration of chronic pain treated with opioids (D1)
- Description or Narration of otHer pain (H)

Assessment of Treatment plan (_A_)
- Positive Assessment of opioid treatment (PA1)
- Negative Assessment of opioid treatment (NA1)
- Ambiguous Assessment of opioid treatment (AA1)
- Positive Assessment of non-opioid treatment of other pain (PA2)
- Negative Assessment of non-opioid treatment of other pain (NA2)
- Ambiguous Assessment of non-opioid treatment of other pain (AA2)

General agreements (not chronic pain issue) (GA)

General disagreements (not chronic pain issue) (GD)

Opioid-related Red Flags and threats (RF1)

OtHer pain-related utterances (H)

Not pain related (X)

B. Codes (by category):

Chronic pain (Opioid context)

All codes with the number 1

Request for opioids (including implicit requests) **(R1)**
Description or Narration of chronic pain treated with opioids **(D1)**
Positive Assessment of opioid treatment **(PA1)**
Negative Assessment of opioid treatment **(NA1)**
Ambiguous Assessment of opioid treatment **(AA1)**
Opioid-related Red Flags and threats **(RF1)**

Other pain (Non-opioid context)

All codes with the numbers 2 - 4 and H

Request for non-opioid medication **(R2)**
Other Requests **(R3)**
Positive Assessment of non-opioid treatment of other pain **(PA2)**
Negative Assessment of non-opioid treatment of other pain **(NA2)**
Ambiguous Assessment of non-opioid treatment of other pain **(AA2)**
General agreements (not chronic pain issue) **(GA2)**
General disagreements (not chronic pain issue) **(GD2)**
Description or Narration of otHer pain **(H)**
OtHer pain-related utterances **(H)**

Non-pain

Not pain related **(X)**

Requests **(R)**

1. Request for opioids (including implicit requests) (R1)

Requests can take the form of commands, questions, conjectures, or statements that express a desire for information or action from the clinician.

A. **Direct requests**. Some patient requests are straightforward, easy to identify, and usually marked by a rising intonation.

- *Can you refill my Norco?*
- *What is the best treatment for my shoulder?*

B. **Implicit requests**: Patients may also make indirect or implicit requests to appear polite or out of respect to the clinician's medical knowledge or their Aesculapian power—the ability to heal based on medical knowledge (Ainsworth-Vaughn, 1995; Brody, 1993). Implicit/indirect requests can take any grammatical form as long as the utterance functions as a request in the context of the visit (Robinson, 2001). Consider the context in which utterances are made in order to decide whether they should be coded as requests.

- *I heard that Norco works well.*
- *My sister took Norco, and it really helped her pain.*
- *I'm running out of Vicodin before the end of the month*
- *I think I did well with this Norco that they gave me* **(Double code R1 and PA1)**

C. **Willingness to taper but**: Patient statements that express both their desire and hesitance to decrease opioid dosage fall under implicit requests. These statements usually start with the patient expressing that they would like to stop taking opioids, followed by a but-statement (or variations thereof). Again, the coder must rely on the context of the conversation when making a decision.

- *I'd like to get off the Norco, but I don't know what else to do for the pain.*
- *I'd like to get off the Norco eventually, but I need it right now.*
- *Yeah, I need a refill on the Norco for now. My ultimate goal is not to take any more of these* [narcotic] *pain medicines.*

D. **Request for opioid refill.** Requests for a routine refill may take place when the clinician is reviewing the patient's medication list. Sometimes, they can be presented in the form of assumptions.

- *It's time to refill my methadone.*
- [response to physician question about which medications need refills] *Norco*

2. Request for non-opioid medication (R2)

Patient request for any pain treatment other than opioids falls under this category. This includes asking for refills for non-opioid medication.

3. Other requests (R3)

A. **Ambiguous requests.** Patient requests for clinician action that do not specify what the action should be. Consider the context in which utterances are made in order to decide whether speaking turn should be coded as an implicit request or ambiguous request.

- *I just need something like, I don't know* **(R3)**
- *Doctor, I've gotta do something about this shoulder.* **(R3)**
- [After demanding opioids earlier in the conversation] *Doctor, you have to do something about this shoulder pain.* **(R1)**

B. **Diagnostic lab requests**. Requests for laboratory imaging, diagnostics, and examinations, including x-rays, imaging studies, biopsy, and microbial culture, among other procedures designed to provide information about the cause of patient's pain. This category includes general requests to resolve diagnostic uncertainties. Requests for tests may take the form of questions.

- *Do you think an MRI would help?* **(R3)**
- *Should we get another blood test?* **(R3)**
- *would an x-ray show anything?* **(R3)**
- *Can I get the blood next week? I don't have time right now.* **(R3)**

C. **Logistical request.** Requests primarily relating to logistics, including issues on paperwork, scheduling, and insurance. For example, requests for an x-ray or MRI result, requests involving paperwork or switching to a different pharmacy, among others, fall under this category.

- *Can I get a copy of that report?* **(R3)**

D. **Information requests.** Requests that solicit information or advice.

- Where is the pharmacy? **(R3)**

Description or Narration of chronic pain **(D)**

This category includes statements in which the patient evaluates their chronic pain and describes its symptoms.

- *The pain is mostly in my shoulder, but sometimes in my back*
- *I am worried about my shoulders.*
- *My shoulder pain sometimes gets me down.*
- *I can't go out anymore; it's so frustrating.* [due to shoulder pain]
- *The shoulder pain is really bad sometimes.*
- *When the pain goes down my arm, I just can't work.*
- *I don't know what I'm going to do.* [about this shoulder pain]
- *Sometimes, I can't stand the pain.* [referring to shoulder pain]

Assessment of treatment plan **(A)**

This category includes patient statements conveying their opinions on pain treatment. They could express satisfaction towards successful treatment, complaints concerning ineffective treatments, as well as ambiguous commentaries on other pain management practices.

1. Positive assessment of opioid treatment (PA1). This code is for patient utterances that express positive evaluation of their opioid prescriptions.

- *I think the Norco does help.*
- *Vicodin is the only thing that helps.*

2. Negative assessment of opioid treatment (NA1). Patient statements that express dissatisfaction with opioids or indicate that opioids are ineffective.

- *The Norco is just not working for me.*

3. Ambiguous assessment of opioid treatment (AA1). Statements conveying uncertainty about opioids or a single turn containing both positive and negative evaluations of opioids are coded under this category.

- *But I don't think -- I don't know whether the Norco* is *really doing anything.* **(AA1)**
- *Norco doesn't work* **(NA1),** *but sometimes it does* **(PA1).** Therefore, **(AA1)**

4. Positive assessments of non-opioid treatments for other pain (PA2). Statements expressing satisfaction and pleasure towards any non-opioid treatment

- *The hydrocortisone is certainly helping a lot with the itching.* **(PA2)**.
- *Tylenol is like the superstar for acute headaches.* **(PA2)**.
- *The inhaler works well.* **(PA2)**.

5. Negative assessments of non-opioid treatments for other pain (NA2). Patient statements expressing dissatisfaction towards any current treatments unrelated to patient's chronic pain.

- *I've tried an ice pack for the knee pain that started the other day. It didn't work.* **(NA2)**
- *I don't like how Omeprazole makes my stomach feel.* **(NA2)**

6. Ambiguous assessments of non-opioid treatments for other pain (AA2). Assessments that indicate the patient's uncertainty towards the effectiveness of any non-opioid/non-chronic pain treatment. Turns with both positive and negative evaluations of non-opioid treatments are classified under this category as long as neither the positive nor the negative dominate the said utterance.[1]

- *The Hydrocortisone, it kinda doesn't work. I mean, I feel a little better, but I still get itchy.* **(AA2)**

Opioid-related **R**ed **F**lags and threats **(RF1)**

Patient comments and statements that suggest they are not taking opioids as prescribed (including increasing dosage, finishing medication before the next refill date, repeated early refill requests, sharing prescriptions with others, doctor shopping, outsourcing opioids, self-medicating). Other red flags include active use of alcohol, illegal drugs, and other controlled substances without the physician's knowledge, justifying protest to treatment change by claiming they are careful and will not overdose, threatening to sue the clinicians, or submitting a grievance.

It is common for opioid-related red flags **(RF1)** to be double coded with implicit opioid requests **(R1).**

- *If you're not gonna help me; I'll go back to using street drugs if I have to* **(RF1)**
- *If you won't help me, I'll find someone who will.* **(RF1)**
- *Without the Norco, I'll be in pain and I don't want to start drinking again.* **(RF1)**
- *I'm still alive, I know my body, I know my medications, I don't know why you won't just prescribe me the Norco. Isn't that your job? To treat people?* **(RF1)**

[1] As much as coding for ambiguous assessments makes for an organized discussion of findings, coding assessments under AA2 instead of PA2 or NA2 will not change the outcomes on vocal cues as they all fall under non-opioid context. This decision is to remain consistent with sticking with the explicit. For instance, if unsure whether a AA2 or a NA2 turn is intended to frame opioids positively (PA1), the rule to choose the explicit (defensible by the data) always takes precedence.

OtHer pain-related utterances **(H2)**

This is a default category used to code pain-related utterances but does not fit in any other categories. Patient utterances coded into this group include descriptions or narration of other pain not treated with opioids. (Since the study recruited patients whose reason for setting an appointment was to discuss chronic pain management, non-opioid pain discussion can be included in this category with other non-chronic pain-related utterances.

- *Is the research study about pain?*
- *My asthma has been bothering me.*
- *My eczema sometimes gets me down. I can't go out anymore; it's so frustrating.*

Non-pain **(X)**

This category includes utterances that are not about pain at all. Most of the time, these are anecdotes and small talk.

- *Good afternoon to you too*
- *Have a nice day*
- *My ex-boyfriend almost backed out after being casted on the Bachelorette. We were still together at the time so he said he felt bad but he still went through it anyway. He lost but then he became the Bachelor for the following season. His name is Justin. Not the Justin C nor the Justin K though, I'm talking about Justin V, the blonde Justin V specifically, because there's like three different Justin V's. That's how I got casted for Ex-on the beach.*

V. Settling double codes

Now that all categories have been introduced, this part of the manual discusses how to resolve turns that could be considered in more than one category.

The order of category precedence are as follows:

1. Codes with the number 1
2. R and D
3. Everything else

If coders all agree that multiple events are taking place within a single turn, then the turn could be broken down into separate units of utterances for the sake of coding and extracting pitch values. (i.e. 598.1 and 598.2 refer to speaking turn 598, parts 1 and 2)

This order is explained with examples and more detail below:

For mixed assessments: When a single turn evaluates both opioid and non-opioid treatments, code the utterance as an assessment of an opioid.

- *Norco has helped with my shoulders* **(PA1)** *and hydrocortisone has helped with my itching* ~~**(PA2).**~~ *(PA1 has precedence).*
- *Norco works a lot better* **(PA1)** *than Ibuprofen* [for shoulders pain] ~~**(NA2)**~~ *(PA1 has precedence).*
- *I'll stick with the oxycodone over Tylenol* **(R1)** ~~**(PA1).**~~ *Although satisfaction is implied, the purpose of the verb "stick" is to continue the current routine of refilling opioids)*

For implicit requests and Negative/Ambiguous Assessments of Opioids: If the negative assessment is about the inadequacy of the current dosage, coders must consider whether the evaluation acts as an implicit request for more opioids **(R1).** If the negative assessment comes shortly before a request for increased dosage, or if it has been established earlier in the visit that the patient desires an increased dose, then the negative assessment **(NA1)** shall be coded as an implicit request simply because the negative assessment is not of the opioid but the dosage. Justifying the need for more dosage affirms that the patient believes in the efficacy of opioids and should therefore be coded as a request **(R1).**

- *I don't think the Norco is strong enough; maybe the dose isn't enough or something.* **(R1)**
- *I think I need a different dose because it only works for a few hours, and then I am in pain again.* **(R1)**

Similarly, if patients express wanting to switch to a different type or brand of opioids, negative reviews of a particular brand and positive evaluations of another are justifications for the request. Thus, the ambiguous assessment (AA1) shall be coded as (R1)

- *I think my body is getting used to the Dilaudid. Norco worked well for my sister, though.* **(R1)**
- *I don't think the oxycontin is strong enough, Norco worked well for sister. I just need it to be a little higher in dose.* **(R1)**
- *I'm not sure Oxycontin works. I don't know what works. My friend said Norco was very effective.* **(R1)**

For descriptions and assessments. Description of chronic pain **(D)** may also qualify as an Assessment **(A).** If the patient comments on the effectiveness of opioids while simultaneously discussing their pain, code the turn as a description of pain.

- *My shoulders are still hurting regardless of if I take the Norco.* **(D1)**

Appendix F: Pitch Tracking Data (Chapter 5)

Patient D

Speaking Turn	Context	Mean	Min	Max	Range	Opioid Context?	Pain Context?	st	Norm st
9	H	164.783	120.73	208.855	88.125		✓	8.6	-3.1
12	H	163.907	130.007	204.602	74.595		✓	8.6	-3.1
12.2	H	184.007	128.17	246.504	118.334		✓	10.6	-1.1
14	H	184.689	135.189	228.14	92.951		✓	10.6	-1.1
14.2	H	186.901	138.096	214.035	75.939		✓	10.8	-0.9
14.3	H	183.109	125.165	300.135	174.97		✓	10.5	-1.2
16	H	179.63	145.518	218.222	72.704		✓	10.1	-1.6
22	R1	136.113	119.113	283.215	164.102	✓	✓	5.3	-6.4
24	D1	177.309	125.172	246.814	121.642	✓	✓	9.9	-1.8
24	D1	185.491	135.693	233.374	97.681	✓	✓	10.7	-1
26	D1	169.521	136.813	204.808	67.995	✓	✓	9.1	-2.6
28	H	174.096	129.277	219.569	90.292		✓	9.6	-2.1
30	H	173.692	121.563	264.423	142.86		✓	9.5	-2.2
32	H	193.155	157.114	262.798	105.684		✓	11.4	-0.3
34	H	183.187	158.745	214.013	55.268		✓	10.5	-1.2
45	H	197.092	115.095	324.744	209.649		✓	11.7	0
47	H	200.927	149.362	335.386	186.024		✓	12.1	0.4
49	H	191.869	115.343	298.943	183.6		✓	11.3	-0.4
53	H	192.296	150.457	227.269	76.812		✓	11.3	-0.4
67	H	206.175	134.382	303.281	168.899		✓	12.5	0.8
69	H	186.492	147.243	255.286	108.043		✓	10.8	-0.9
71	H	195.17	144.291	274.186	129.895		✓	11.6	-0.1
73	H	203.499	169.799	249.01	79.211		✓	12.3	0.6
75	H	190.273	144.114	253.458	109.344		✓	11.1	-0.6
102	H	190.403	144.018	251.154	107.136		✓	11.2	-0.5
104	H	173.239	125.369	246.372	121.003		✓	9.5	-2.2
106	H	214.232	142.61	266.435	123.825		✓	13.2	1.5
108	R1	182.516	139.534	243.977	104.443	✓	✓	10.4	-1.3
110	R1	157.005	137.904	198.482	60.578	✓	✓	7.8	-3.9
118	R1	184.221	159.142	280.263	121.121	✓	✓	10.6	-1.1
120	R1	185.716	155.096	251.27	96.174	✓	✓	10.7	-1

122	R1	187.532	155.309	306.435	151.126	✓	✓	10.9	-0.8
124	H	205.96	134.761	301.223	166.462		✓	12.5	0.8
126	H	173.122	152.454	273.56	121.106		✓	9.5	-2.2
128	H	186.943	154.141	239.359	85.218		✓	10.8	-0.9
130	H	210.177	142.305	265.149	122.844		✓	12.9	1.2
132	D1	168.11	111.353	246.173	134.82	✓	✓	9	-2.7
136	H	210.058	163.922	248.125	84.203		✓	12.9	1.2
138	D1	149.553	130.15	165.406	35.256	✓	✓	7	-4.7
140	H	193.969	143.913	256.311	112.398		✓	11.5	-0.2
142	H	189.595	130.251	212.011	81.76		✓	11.1	-0.6
144	H	192.092	167.696	228.539	60.843		✓	11.3	-0.4
146	H	171.283	121.216	222.346	101.13		✓	9.3	-2.4
148	H	192.422	146.019	259.952	113.933		✓	11.3	-0.4
158	H	183.827	158.028	216.97	58.942		✓	10.5	-1.2
169	H	196.024	157.312	233.51	76.198		✓	11.7	0
171	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
173	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
186	X	Creaky	Creaky	Creaky	Creaky			Creaky	Creaky
188	X	206.509	125.535	221.292	95.757			12.6	0.9
193	X	Creaky	Creaky	Creaky	Creaky			Creaky	Creaky
208	X	Creaky	Creaky	Creaky	Creaky			Creaky	Creaky
216	X	209.451	142.896	256.617	113.721			12.8	1.1
218	H	189.623	160.729	212.696	51.967		✓	11.1	-0.6
221	X	Creaky	Creaky	Creaky	Creaky			Creaky	Creaky
231	X	Creaky	Creaky	Creaky	Creaky			Creaky	Creaky
239	H	203.089	122.546	317.979	195.433		✓	12.3	0.6
247.2	R3	205.438	140.842	259.43	118.588		✓	12.5	0.8
247.3	R3	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
254	H	193.994	167.462	214.392	46.93		✓	11.5	-0.2
260	H	203.373	155.662	313.438	157.776		✓	12.3	0.6
262	H	197.593	168.619	232.01	63.391		✓	11.8	0.1
271	H	186.351	115.262	252.639	137.377		✓	10.8	-0.9
273	X	201.51	143.765	244.479	100.714			12.1	0.4
275	X	203.438	136.561	216.375	79.814			12.3	0.6
279	X	Creaky	Creaky	Creaky	Creaky			Creaky	Creaky
303	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
305	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky

307	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
311	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
313	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
315	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
317	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
319	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
325	H	168.923	115.235	220.667	105.432		✓	9.1	-2.6
341	H	179.78	129.131	219.357	90.226		✓	10.2	-1.5
357	R3	199.216	154.459	270.33	115.871		✓	11.9	0.2
359	RF1	190.259	145.832	238.316	92.484	✓	✓	11.1	-0.6
361	NA2	190.415	157.972	242.936	84.964		✓	11.1	-0.6
363	H	192.312	157.468	273.975	116.507		✓	11.3	-0.4
365	H	195.694	147.233	274.21	126.977		✓	11.6	-0.1
369	H	204.48	126.311	285.751	159.44		✓	12.4	0.7
371	H	215.318	161.889	270.477	108.588		✓	13.3	1.6
373	H	203.487	168.835	253.628	84.793		✓	12.3	0.6
375	H	219.21	141.131	279.262	138.131		✓	13.6	1.9
377	RF1	200.914	143.658	250.758	107.1	✓	✓	12.1	0.4
379	H	219.21	131.131	289.22	158.089		✓	13.6	1.9
381	R1	180.93	146.658	228.98	82.322	✓	✓	10.3	-1.4
383	D1	167.792	127.175	232.103	104.928	✓	✓	9	-2.7
387	D1	169.769	132.357	207.39	75.033	✓	✓	9.2	-2.5
389	H	197.88	145.9	289.67	143.77		✓	11.8	0.1
399	PA1	187.04	142.16	235.904	93.744	✓	✓	10.8	-0.9
401	H	181.878	155.25	252.788	97.538		✓	10.4	-1.3
407	H	200.035	124.344	253.802	129.458		✓	12	0.3
411	H	199.921	161.501	267.553	106.052		✓	12	0.3
425	H	200.073	130.863	284.587	153.724		✓	12	0.3
427	**H**	199.385	156.325	290.202	133.877		✓	11.9	0.2
443	X	200.899	140.533	238.628	98.095			12.1	0.4
447	X	202.271	143.439	247.937	104.498			12.2	0.5
451	X	198.665	137.752	287.606	149.854			11.9	0.2
453	X	199.63	168.179	291.13	122.951			12	0.3
491	H	180.386	159.74	263.798	104.058		✓	10.2	-1.5
493	H	169.453	134.69	231.948	97.258		✓	9.1	-2.6
495	GD2	201.775	155.35	279.71	124.36		✓	12.2	0.5
499	H	192.941	145.153	295.153	150		✓	11.4	-0.3

503	GD2	196.534	149.131	253.357	104.226		✓	11.7	0
505	NA2	181.846	155.153	257.07	101.917		✓	10.3	-1.4
507	H	180.464	165.953	253.843	87.89		✓	10.2	-1.5
509	H	202.224	156.481	274.004	117.523		✓	12.2	0.5
511	RF1	187.441	143.887	251.711	107.824	✓	✓	10.9	-0.8
513	RF1	192.885	136.668	255.098	118.43	✓	✓	11.4	-0.3
517	H	203.678	134.614	287.051	152.437		✓	12.3	0.6
521	H	197.946	163.413	286.381	122.968		✓	11.8	0.1
523	H	228.889	154.041	373.66	219.619		✓	14.3	2.6
525	H	207.04	162.16	305.904	143.744		✓	12.6	0.9
527	RF1	199.972	155.253	292.426	137.173	✓	✓	12	0.3
529	NA2	208.439	155.087	296.758	141.671		✓	12.7	1
531	GD2	203.858	156.22	278.364	122.144		✓	12.3	0.6
533	D1	180.552	128.571	218.881	90.31	✓	✓	10.2	-1.5
535	H	210.425	151.954	302.841	150.887		✓	12.9	1.2
537	H	219.52	138.365	276.878	138.513		✓	13.6	1.9
539	R3	212.914	156.313	302.98	146.667		✓	13.1	1.4
541	R3	196.888	134.199	302.186	167.987		✓	11.7	0
543	GD2	195.955	134.43	288.258	153.828		✓	11.7	0
545	H	211.177	174.251	294.834	120.583		✓	12.9	1.2
547	RF1	204.082	174.684	285.723	111.039	✓	✓	12.3	0.6
549	H	198.736	173.114	290.267	117.153		✓	11.9	0.2
551	R1	188.943	130.45	265.995	135.545	✓	✓	11	-0.7
553	GD2	201.676	166.885	292.605	125.72		✓	12.1	0.4
555	H	213.585	140.02	294.485	154.465		✓	13.1	1.4
557	H	184.469	132.948	225.704	92.756		✓	10.6	-1.1
559	R3	187.834	152.264	221.348	69.084		✓	10.9	-0.8
562	R3	225.412	177.142	285.305	108.163		✓	14.1	2.4
564	GD2	203.757	150.412	292.27	141.858		✓	12.3	0.6
566	H	208.579	138.25	288.655	150.405		✓	12.7	1
568	NA2	203.338	135.995	300.237	164.242		✓	12.3	0.6
570	R3	213.39	154.772	284.089	129.317		✓	13.1	1.4
572	H	235.596	156.295	310.296	154.001		✓	14.8	3.1
574	H	214.883	169.737	313.636	143.899		✓	13.2	1.5
576	H	221.902	152.495	279.186	126.691		✓	13.8	2.1
578	H	220.564	169.27	292.588	123.318		✓	13.7	2

596	D1	179.961	119.002	215.887	96.885	✓	✓	10.2	-1.5
598.1	D1	170.218	138.593	204.603	66.01	✓	✓	9.2	-2.5
598.2	RF1	244.784	158.553	397.457	238.904	✓	✓	15.5	3.8
600	H	202.84	171.158	298.37	127.212		✓	12.2	0.5
602	H	214.079	153.633	290.977	137.344		✓	13.2	1.5
604	PA1	213.443	148.843	282.315	133.472	✓	✓	13.1	1.4
606	RF1	200.694	181.216	282.63	101.414	✓	✓	12.1	0.4
608	H	190.604	155.014	287.312	132.298		✓	11.2	-0.5
610	H	191.14	163.84	261.937	98.097		✓	11.2	-0.5
614	GD2	180.394	152.649	267.89	115.241		✓	10.2	-1.5
618	GD2	198.061	177.285	302.704	125.419		✓	11.8	0.1
620	GD2	214.741	174.543	292.981	118.438		✓	13.2	1.5
622	H	199.76	171.271	302.349	131.078		✓	12	0.3
626	NA2	206.748	162.679	290.65	127.971		✓	12.6	0.9
628	D1	187.54	142.816	260.246	117.43	✓	✓	10.9	-0.8
630	GD2	199.482	158.285	289.327	131.042		✓	12	0.3
632	H	206.054	178.051	308.142	130.091		✓	12.5	0.8
634	H	204.211	176.155	311.083	134.928		✓	12.4	0.7
636	H	209.86	158.6	311.024	152.424		✓	12.8	1.1
638	H	207.745	166.702	314.258	147.556		✓	12.7	1
642	H	192.382	154.829	292.289	137.46		✓	11.3	-0.4
644	H	183.437	173.388	281.969	108.581		✓	10.5	-1.2
646	R3	199.755	163.888	267.17	103.282		✓	12	0.3
654	H	212.745	166.702	314.258	147.556		✓	13.1	1.4
658	X	202.745	146.702	242.258	95.556			12.2	0.5
660	R3	202.366	145.511	304.686	159.175		✓	12.2	0.5
664	H	182.366	145.511	244.686	99.175		✓	10.4	-1.3
674	GD2	219.293	157.325	282.693	125.368		✓	13.6	1.9
676	H	205.766	174.508	310.662	136.154		✓	12.5	0.8
678	H	203.675	143.088	316.62	173.532		✓	12.3	0.6
680	RF1	218.837	151.444	306.27	154.826	✓	✓	13.6	1.9
686	H	207.516	137.65	271.281	133.631		✓	12.6	0.9
688	H	219.621	197.805	279.329	81.524		✓	13.6	1.9
690	H	189.258	168.801	297.935	129.134		✓	11	-0.7
692	H	180.787	160.833	198.839	38.006		✓	10.3	-1.4
696	H	190.905	180.207	273.403	93.196		✓	11.2	-0.5

698	H	198.72	156.461	290.714	134.253		✓	11.9	0.2
700	H	190.164	169.417	282.201	112.784		✓	11.1	-0.6
702	R3	187.912	149.705	226.951	77.246		✓	10.9	-0.8
704	R3	184.456	133.748	229.723	95.975		✓	10.6	-1.1
706	R3	183.906	143.671	205.45	61.779		✓	10.5	-1.2
708	RF1	183.333	170.926	283.102	112.176	✓	✓	10.5	-1.2

*Note. Shaded cells denote entirely creaky speaking turn. Gaps in sequence could be any of the following: physician or companion turns, one-word back channels, or turns compromised by constant overlap talking or external sounds.**

Patient E

Speaking Turn	Context	Mean	Min	Max	Range	Opioid Context?	Pain Context?	st	Norm st
8	X	166.005	140.428	235.628	95.2			8.8	-0.6
10	H	152.624	125.386	173.289	47.903		✓	7.3	-2.1
12	R2	138.099	121.188	159.123	37.935		✓	5.6	-3.8
16	H	199.853	100.725	305.317	204.592		✓	12	2.6
18	AA2	160.675	134.325	186.21	51.885		✓	8.2	-1.2
26	PA1	177.498	157.108	198.591	41.483	✓	✓	9.9	0.5
28	PA1	172.222	141.605	300.588	158.983	✓	✓	9.4	0
30	H	179.623	138.108	241.546	103.438		✓	10.1	0.7
32.1	H	184.535	100.304	287.728	187.424		✓	10.6	1.2
32.2	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
34	H	145.018	114.272	162.64	48.368		✓	6.4	-3
36	R3	176.542	135.526	197.539	62.013		✓	9.8	0.4
38	R1	162.562	122.836	194.049	71.213	✓	✓	8.4	-1
40	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
42	H	158.633	119.406	230.721	111.315		✓	8	-1.4
44	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
54	H	141.135	118.557	156.776	38.219		✓	6	-3.4
56	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
58	H	177.983	122.46	195.193	72.733		✓	10	0.6
60.1	H	161.995	101.918	261.306	159.388		✓	8.4	-1
60.2	H	129.865	106.853	152.301	45.448		✓	4.5	-4.9
64	AA2	178.737	119.766	285.424	165.658		✓	10.1	0.7
66	H	139.418	123.954	154.07	30.116		✓	5.8	-3.6
76	H	156.025	111.376	187.743	76.367		✓	7.7	-1.7
78	H	154.524	115.797	368.434	252.637		✓	7.5	-1.9
80	H	147.852	134.949	177.544	42.595		✓	6.8	-2.6
82.1	PA2	179.491	104.647	288.368	183.721		✓	10.1	0.7
82.2	PA2	151.381	109.638	261.261	151.623		✓	7.2	-2.2
88	NA2	155.842	121.583	181.912	60.329		✓	7.7	-1.7
90	X	167.448	103.391	170.093	66.702			8.9	-0.5
94	X	176.489	108.333	183.876	75.543			9.8	0.4
98	X	168.945	132.691	185.592	52.901			9.1	-0.3
102	X	214.178	147.974	308.762	160.788			13.2	3.8

104	X	194.182	101.334	326.326	224.992			11.5	2.1
106	X	153.429	100.17	199.934	99.764			7.4	-2
108	X	162.764	114.468	163.471	49.003			8.4	-1
110	X	160.113	114.763	170.869	56.106			8.1	-1.3
122	GA2	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
126	PA2	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
128	R1	146.012	121.302	195.268	73.966	✓	✓	6.5	-2.9
130	R1	Creaky	Creaky	Creaky	Creaky	✓	✓	Creaky	Creaky
132	PA1	168.296	127.908	208.535	80.627	✓	✓	9	-0.4
142	H	214.225	117.833	302.108	184.275		✓	13.2	3.8
144	R1	165.902	106.659	298.712	192.053	✓	✓	8.8	-0.6
148	H	166.445	111.287	243.513	132.226		✓	8.8	-0.6
150	R1	Creaky	Creaky	Creaky	Creaky	✓	✓	Creaky	Creaky
156	PA1	185.18	143.841	278.464	134.623	✓	✓	10.7	1.3
158	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
160	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
162	H	182.424	140.498	210.107	69.609		✓	10.4	1
168	H	195.336	133.528	277.355	143.827		✓	11.6	2.2
170	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
172	D1	154.31	128.947	184.763	55.816	✓	✓	7.5	-1.9
174	D1	139.91	129.548	176.8	47.252	✓	✓	5.8	-3.6
182	H	148.48	117.604	195.388	77.784		✓	6.8	-2.6
184	H	136.775	113.395	163.366	49.971		✓	5.4	-4
186	H	142.943	116.584	181.127	64.543		✓	6.2	-3.2
188	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
190	H	180.28	115.232	208.892	93.66		✓	10.2	0.8
192	H	156.778	121.067	184.443	63.376		✓	7.8	-1.6
196	X	166.715	137.05	183.725	46.675			8.9	-0.5
198	X	161.427	137.1	223.511	86.411			8.3	-1.1
202	X	177.771	135.833	196.231	60.398			10	0.6
206	X	178.27	140.421	205.967	65.546			10	0.6
212	X	183.598	141.789	217.686	75.897			10.5	1.1
218	AA1	195.333	130.635	316.825	186.19	✓	✓	11.6	2.2
220	H	170.216	120.906	317.006	196.1		✓	9.2	-0.2
222	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
226	RF1	188.009	150.631	229.475	78.844	✓	✓	10.9	1.5
228	RF1	133.578	118.2	152.534	34.334	✓	✓	5	-4.4

230	H	142.084	110.959	179.786	68.827		✓	6.1	-3.3
232	PA2	141.32	115.79	155.252	39.462		✓	6	-3.4
234	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
236	PA2	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
238	PA2	146.74	120.588	163.096	42.508		✓	6.6	-2.8
242	H	166.32	143.79	202.252	58.462		✓	8.8	-0.6
244	H	147.206	115.181	197.838	82.657		✓	6.7	-2.7
246	D1	Creaky	Creaky	Creaky	Creaky	✓	✓	Creaky	Creaky
248	AA1	146.941	128.79	167.802	39.012	✓	✓	6.7	-2.7
250	D1	Creaky	Creaky	Creaky	Creaky	✓	✓	Creaky	Creaky
254	AA1	184.612	148.452	226.275	77.823	✓	✓	10.6	1.2
256	H	149.581	131.797	181.258	49.461		✓	7	-2.4
258	H	163.581	135.16	227.925	92.765		✓	8.5	-0.9
262	X	187.25	153.025	216.713	63.688			10.9	1.5
264	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
266	X	184.591	145.828	200.406	54.578			10.6	1.2
268	X	211.534	189.824	293.409	103.585			13	3.6
270	X	176.493	134.692	182.49	47.798			9.8	0.4
274	H	165.194	152.004	197.879	45.875		✓	8.7	-0.7
276	H	207.691	154.513	268.775	114.262		✓	12.7	3.3
280	H	196.265	146.468	236.122	89.654		✓	11.7	2.3
282	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
284	H	172.484	124.512	191.048	66.536		✓	9.4	0
288	NA2	174.823	120.912	240.868	119.956		✓	9.7	0.3
294	NA2	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
296	AA2	172.266	136.523	249.397	112.874		✓	9.4	0
306	R1	135.04	111.836	175.426	63.59	✓	✓	5.2	-4.2
308	R1	145.448	130.644	196.753	66.109	✓	✓	6.5	-2.9
310	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
312	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
314	X	185.551	142.377	194.58	52.203			10.7	1.3
316	X	192.964	125.025	237.809	112.784			11.4	2
320	X	190.5	119.506	270.648	151.142			11.2	1.8
322	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
324	X	194.728	144.047	281.585	137.538			11.5	2.1
328	X	175.73	149.311	326.779	177.468			9.8	0.4
336	H	147.309	110.679	223.24	112.561		✓	6.7	-2.7

338	X	180.55	128.311	191.98	63.669			10.2	0.8
342	X	Creaky	Creaky	Creaky	Creaky			Creaky	Creaky
344	X	191.532	122.608	205.782	83.174			11.3	1.9
346	X	170.863	145.521	173.785	28.264			9.3	-0.1
350	X	178.061	128.689	196.973	68.284			10	0.6
352	X	183.844	133.152	203.237	70.085			10.5	1.1
354	X	Creaky	Creaky	Creaky	Creaky			Creaky	Creaky
358	X	Creaky	Creaky	Creaky	Creaky			Creaky	Creaky
360	X	184.729	117.03	190.83	73.8			10.6	1.2
362	X	191.642	121.77	289.364	167.594			11.3	1.9
370	X	190.976	122.748	296.334	173.586			11.2	1.8
372	H	169.734	113.919	212.009	191.09		✓	9.2	-0.2
374	PA1	Creaky	Creaky	Creaky	Creaky	✓	✓	Creaky	Creaky
376	AA1	Creaky	Creaky	Creaky	Creaky	✓	✓	Creaky	Creaky
380	X	193.931	118.783	216.974	98.191			11.5	2.1
382	X	187.229	129.394	221.764	92.37			10.9	1.5
384	X	192.489	133.18	197.468	64.288			11.3	1.9
386	X	187.489	123.18	207.468	84.288			10.9	1.5
390	X	180.862	120.746	214.232	93.486			10.3	0.9
392	X	191.623	126.211	205.629	79.418			11.3	1.9
406	X	176.623	123.211	225.629	102.418			9.9	0.5
412	R2	193.426	120.306	281.224	160.918		✓	11.4	2
414	NA2	182.169	113.654	227.654	114		✓	10.4	1
416	R2	170.456	112.05	219.238	107.188		✓	9.2	-0.2
420	X	Creaky	Creaky	Creaky	Creaky			Creaky	Creaky
422	X	Creaky	Creaky	Creaky	Creaky			Creaky	Creaky
426	X	176.332	144.982	200.638	55.656			9.8	0.4
428	X	178.467	112.391	208.232	95.841			10	0.6
432	X	172.776	119.618	192.262	72.644			9.5	0.1
442	H	190.682	145.073	287.774	142.701		✓	11.2	1.8
446	D1	Creaky	Creaky	Creaky	Creaky	✓	✓	Creaky	Creaky
448	X	209.309	155.192	297.991	142.799			12.8	3.4
450	X	199.723	125.112	310.076	184.964			12	2.6
464	H	160.604	119.066	193.752	74.686		✓	8.2	-1.2
466	D1	Creaky	Creaky	Creaky	Creaky	✓	✓	Creaky	Creaky
470	H	143.25	116.832	166.954	50.122		✓	6.2	-3.2
472	D1	163.308	119.957	187.37	67.413	✓	✓	8.5	-0.9
474	H	163.476	121.175	171.586	50.411		✓	8.5	-0.9

476	NA2	208.878	144.578	295.197	150.619		✓	12.8	3.4
478	NA2	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
481	H	189.654	122.573	290.198	167.625		✓	11.1	1.7
485	AA2	194.172	161.523	296.41	134.887		✓	11.5	2.1
487	H	165.668	116.098	299.208	183.11		✓	8.7	-0.7
491	GA2	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
493	AA2	196.118	118.226	283.964	165.738		✓	11.7	2.3
495	H	172.827	160.222	200.849	40.627		✓	9.5	0.1
507	X	Creaky	Creaky	Creaky	Creaky			Creaky	Creaky
526	H	181.551	123.824	219.34	95.516		✓	10.3	0.9
528	R3	177.551	113.924	199.324	85.4		✓	9.9	0.5
532	H	155.571	137.435	193.596	56.161		✓	7.6	-1.8
534	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
536	D1	Creaky	Creaky	Creaky	Creaky	✓	✓	Creaky	Creaky
538	H	162.539	115.185	195.999	80.814		✓	8.4	-1
540	H	178.268	142.035	280.391	138.356		✓	10	0.6
544	H	172.569	116.159	203.385	87.226		✓	9.4	0
548	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
554	H	198.014	112.315	205.929	93.614		✓	11.8	2.4
556	RF1	134.136	110.134	164.631	54.497	✓	✓	5.1	-4.3
558	D1	Creaky	Creaky	Creaky	Creaky	✓	✓		
560	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
564	GA2	164.302	135.567	187.228	51.661		✓	8.6	-0.8
574	H	Creaky	Creaky	Creaky	Creaky		✓	Creaky	Creaky
578	H	145.543	114.816	185.662	70.846		✓	6.5	-2.9
582	H	145.782	112.054	188.418	76.364		✓	6.5	-2.9
584	H	171.92	118.073	198.94	80.867		✓	9.4	0
586	H	188.267	120.89	192.344	71.454		✓	11	1.6
588	H	142.464	127.835	163.073	35.238		✓	6.1	-3.3
592	R3	198.572	150.694	308.15	157.456		✓	11.9	2.5
598.1	H	130.993	115.929	163.524	47.595		✓	4.7	-4.7
598.2	H	150.993	120.855	203.446	82.591		✓	7.1	-2.3

*Note. Shaded cells denote entirely creaky speaking turn. Gaps in sequence could be any of the following: physician or companion turns, one-word back channels, or turns compromised by constant overlap talking or external sounds.**

Patient D Summary

Baseline	
Semitones	**Average pitch**
11.7 ($\tilde{x}$)	195.298 ($\bar{x}$)

		Semitones		Average pitch			
	Code	**st**	**norm st**	**mean f_0**	**min**	**max**	**range**
I. Pain		**11.5**	**-0.2**	**194.868**	**149.127**	**267.366**	**118.238**
Pain: Opioid		**10.7**	**-1.0**	**184.919**	**142.710**	**253.42**	**110.709**
Narration of pain and description of symptoms	D1	9.5	**-1.0**	173.256	129.790	221.426	91.635
Request for opioid treatment	R1	10.1	-1.6	175.372	142.901	257.327	114.426
Positive assessments / satisfaction with opioids	PA1	12.0	0.3	200.242	145.502	259.11	113.608
Opioid related threats/red flags	RF1	12.2	0.5	202.32	156.212	284.349	128.137
Pain: Non-Opioid		**11.7**	**0**	**197.316**	**150.706**	**270.797**	**120.090**
Other requests (information and logistics)	R3	12	0.3	199.625	148.05	290.2	142.150
Negative assessments / dissatisfaction with non-opioid treatments	NA2	11.8	0.1	198.157	153.377	277.53	124.153
Disagreement or resistance	GD2	12.1	0.4	201.411	157.501	283.651	126.149
Other Pain Related Utterances	H	11.6	-0.1	196.49	149.827	269.928	120.101
II. Non-Pain	X	12.2	0.5	202.791	142.818	249.591	106.773

Patient E Summary

Baseline	
Semitones	**Average pitch**
9.4 ($\tilde{x}$)	171.108 ($\bar{x}$)

		Semitones		Average pitch			
	Code	**st**	**norm st**	**mean f_0**	**min**	**max**	**range**
I. Pain		**8.6**	**-0.8**	**165.816**	**124.725**	**219.141**	**95.416**
Pain: Opioid		**8.1**	**-1.3**	**165.816**	**124.725**	**219.141**	**95.416**
Narration of pain and description of symptoms	D1	7.3	-2.1	152.509	126.151	182.978	56.827
Request for opioid treatment	R1	7.1	-2.3	150.993	118.655	212.042	93.386
Positive assessments / satisfaction with opioids.	PA1	9.8	0.4	175.799	142.616	246.545	103.929
Expressions of uncertainty or ambiguity about opioids	AA1	9.6	0.2	175.629	135.959	236.967	101.008
Opioid related threats/red flags	RF1	7.0	-2.4	151.908	126.322	182.213	55.892
Pain: Non-Opioid		**8.8**	**-0.6**	**166.968**	**123.606**	**220.363**	**97.998**
Request for non-opioid treatment	R2	8.7	-0.7	167.327	122.899	219.862	102.014
Other requests (information and logistics)	R3	10.5	1.1	184.222	133.381	235.004	101.623
Positive assessments /satisfaction with non-opioid treatments.	PA2	7.5	-1.9	154.733	112.666	216.994	104.329

Negative assessments / dissatisfaction with non-opioid treatments	NA2	10.2	0.8	180.428	125.182	236.408	111.226
Expressions of uncertainty or ambiguity about a non-opioid treatment plan	AA2	10.2	0.8	180.394	134.073	260.281	126.208
Agreement	GA2	8.6	-0.8	164.302	135.567	187.228	51.661
Other Pain Related Utterances	H	8.5	-0.9	164.747	122.899	215.644	94.436
II. Non-Pain	X	10.4	1.0	182.552	130.493	223.785	93.291