

ABSTRACT

Title of Dissertation: *COMMUNICATING THE RISKS AND BENEFITS OF PRESCRIPTION OPIOID USE: SELF-CATEGORIZATION AS AN INTRINSIC MESSAGE FEATURE THAT INFLUENCES CONSTRUAL LEVEL*

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The opioid crisis presents a challenge for risk communicators because the judicious short-term use of prescription opioids for noncancer pain may benefit quality of life but also poses risks such as the development of opioid use disorder, thus prompting calls for messaging to reduce the demand for prescription opioids. Communicating the possibility for benefits of short-term prescription opioid use and the risks is therefore ethically required, but message characteristics that simultaneously reduce the demand for opioids while offering complete information about its benefits would be most useful and ethical. Construal level theory posits that altering the level of abstraction of one's mental representation of a choice meaningfully affects one's cognitions and behaviors regarding said choice. However, in this theoretical framework changing the mental representation of a choice is usually achieved by methods unsuitable for public health messages that are communicated to a large audience (e.g., priming or changing the characteristics of a choice to be more psychologically distant) or interpersonally. Recognizing the limitations of these approaches, I suggest that self-categorization with its focus on self-construals at

increasingly abstract levels may act as a potential intrinsic message feature that can affect construal level without altering the characteristics of the choice being evaluated. A thought-listing pilot study demonstrated that self-categorizing at the relational (i.e., significant other) versus subordinate level (i.e., individual) affects the type of salient behavioral beliefs. Study 1 experimentally demonstrated that altering self-categorization changes the extent to which participants focus on the pros of prescription opioid use (high construal level beliefs) but not their focus on the cons of use or psychological distance. However, psychological distance, pro focus, and con focus all predicted intent to use prescription opioids. Study 2 experimentally demonstrated that altering self-categorization in a message about pros and cons of using prescription opioids significantly indirectly predicted attitudes, subjective norm, and perceived behavioral control over prescription opioid use mediated by identity salience. Attitudes, subjective norm, and perceived behavioral control in turn predicted behavioral intent to use prescription opioids. This dissertation integrates construal level theory and self-categorization theory to provide an intrinsic message feature that alters behavioral intention to use prescription opioids.

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USE: SELF-CATEGORIZATION AS AN INTERINSIC MESSAGE FEATURE
THAT INFLUENCES CONSTRUAL LEVEL

by

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Dedication

This dissertation is dedicated to my family who provided unwavering support during the six years I have pursued my PhD. My twin sister Alex who has been my constant companion, vehement defender, and best friend. My parents Matt and Susan who instilled my love for reading and writing, encouraged me when the going got tough, and calmed me down when necessary. Brett, Ellie, and Elliot for reminding me that life exists outside of the academy. Dick and Connie for the wine, wisdom, and suburban escape. Beth and Wally for the long talks and baked goods. Finally, for my sweet boy Tucker who sat at my feet as I wrote this dissertation.

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Chapter 1: Introduction

Rising rates of opioid use, misuse, and abuse have been described as an “opioid epidemic” (Rudd et al., 2016a, p. 1145) and a “national public health emergency” (Christie et al., 2017, p. 5). Opioids are a class of drugs that include the illegal drug heroin, the synthetic drug fentanyl, and prescription pain relievers including oxycodone, hydrocodone, codeine, morphine, and others (U.S. Department of Health and Human Services, 2018). Since 2000, there has been a 200% increase in the rate of opioid-related overdose deaths (Rudd et al., 2016b). In 2015, a total of 52,404 people in the United States died from a drug overdose, of those deaths 63.1% involved an opioid (Rudd et al., 2016b). Americans across all demographic groups have been impacted by opioid overdose. Significant increases in overdose death rates from 2013-2014 occurred among both males and females, among many age groups ranging from persons aged 25-34 and persons aged 65 and older, non-Hispanic blacks and non-Hispanic whites, and persons residing in the Northeast, Midwest, and South U.S. Census regions (Rudd et al., 2016a). Other risks of opioid use include the development of opioid use disorder (OUD), “a problematic pattern of opioid use leading to clinically significant impairment or distress” that may be manifested by “unsuccessful efforts to cut down or control use and use resulting in social problems and failure to fulfill major role obligations at work, school, or home” (Dowell et al., 2016, p. 2). Recognizing the risks of prescription opioid use, the Centers for Disease Control and Prevention guidelines for prescribing opioids for chronic pain acknowledge first that nonopioid therapy is preferred for treatment of chronic pain and that “opioids should be used only when benefits for pain and function are expected to outweigh risks” (Dowell et al., 2016, p. 1624). All people considering whether to initiate

prescription opioid use must weigh the benefits and risks of opioid use. This benefit/risk analysis constitutes the central dilemma of prescription opioid use. In response to this dilemma, the CDC recommends that physicians communicate both benefits and risks of opioid use before initiating opioid treatment and throughout treatment (Dowell et al., 2016).

The problem of opioid crisis can be addressed from the following intervention points: prevention, treatment, law enforcement, and long-term healthcare (Johnson, 2018). A 2011 report from the Office of National Drug Control Policy shifted the agency's focus from what had been termed the "War on Drugs" to a more evidence-based proactive approach (Davis et al., 2018). This approach sees government agencies using public health rhetoric to describe substance use disorder rather than rhetoric that blames, shames, and punishes those with a substance use disorder (Davis et al., 2018). Most interventions focus on responding to those already suffering from OUD. Such harm reduction strategies include education about signs of overdose, good Samaritan laws, increasing the availability of drug testing kits, and providing naloxone kits and training on administration (Schweitzer et al., 2018). Still, there are barriers to many treatment interventions, for example, the treatment of OUD with agonist medications (i.e., medications that bind to and activate opioid receptors in the brain without producing euphoria) like buprenorphine and methadone is generally recognized as the most effective treatment for OUD (Hall & Farrell, 2018). However, access to these medications is hampered by lack of insurance coverage, limitations to the number of patients a doctor can prescribe opioid agonists to, and stigmatized systems of opioid treatment clinics that require patients to attend a clinic daily to receive methadone

treatment (Nadelmann & LaSalle, 2017). Similarly, while “Good Samaritan” laws legally protect those who witness an overdose and call emergency services, delay in seeking medical help is a major contributor to overdose fatalities due in part to the misconception that witnesses risk prosecution for drug possession (Schweitzer et al., 2018). Another intervention frequently implemented in healthcare systems is prescription monitoring programs (PDMPs). PDMPs are “statewide databases used by physicians, pharmacists, and law enforcement to obtain data about controlled-drug prescriptions with the goal of detecting substance-use disorders, drug-seeking behaviors, and reducing patient risks of adverse drug events” (Elder et al., 2017). These state and national-level policies are in fact widely adopted across the U.S.¹ (Parker et al., 2018).

Hospitals are good intervention points to target OUD because initial opioid use often occurs in hospital settings and patients with OUD often attend hospitals to receive medical care (Kim et al., 2017). Advocates for interventions to reduce inappropriate prescribing practices in hospital settings suggest that interventions target the following: monitoring and providing feedback on inpatient opioid prescribing patterns, expose healthcare trainees to formal addiction and pain management education, and engage healthcare providers in screening and management of OUD as well as the creation of programs to help those with OUD transition from hospital to community settings (Kim et al., 2017). Distributing naloxone for overdose prevention in emergency departments to people at risk of overdose, as well as training on the use of naloxone and overdose education is an additional clinical-based intervention (Drainoni et al., 2016). However,

¹ All 50 states operate PDMPs, all 50 states cover buprenorphine under Medicaid though only 34 cover methadone, 50 states have naloxone access laws, 41 states have syringe exchange programs, and 40 states have “Good Samaritan” immunity laws

barriers to its implementation include under-developed implementation plans, challenges in identifying which patients should receive the intervention, finding the best time to distribute naloxone to patients, and challenges with the patients themselves who likely are struggling with additional issues such as housing or employment (Drainoni et al., 2016). While many interventions focus on improving how healthcare providers prescribe opioids and screen for OUD, there is less focus on addiction treatment (Sharfstein, 2017). Indeed, healthcare providers are reluctant to treat addiction (Sharfstein, 2017). Interventions should address these issues. Beyond hospital-based healthcare providers, pharmacists may also be excellent intervention points because they are the most easily accessible health professionals and can engage in behaviors such as point-of-care testing, patient consultations, PDMP monitoring, helping patients safely dispose of unwanted opioids, dispensing naloxone, and provide clean syringes to reduce the harms of opioids misuse and abuse (Rowan Mahon et al., 2018).

Possible prevention strategies implemented locally in some of the hardest hit regions include door-to-door information canvassing, distributing naloxone, and coordinating among healthcare and advocacy groups (Johnson, 2018). Other prevention strategies may target more upstream contributors to “minimize risk factors of addiction (i.e., childhood trauma, mental illness) and maximize protective factors (i.e., family, school, and community support systems” (Schweitzer et al., 2018, p. 34). An additional difficulty in combatting the opioid crisis is the dearth of robust, timely, and accurate opioid-related data that may be used to target interventions, such as information about why fluctuations in opioid use prevalence occur, the types of opioids being used, and where opioids are being used (Abdessalam et al., 2018). Recent studies have suggested

using social media as a tool to examine public perceptions and documented use of opioids, though this approach also has limitations (Tibebu et al., 2018). Lack of evidence that prescription opioids effectively reduce chronic non-cancer pain coupled with the significant risks of opioid use has led some to advocate for cannabis as an alternative to opioid analgesics, though with the caveat that cannabis use is federally illegal, though approved for medical use in some states (O’Keefe, 2013), and substantial provider education is required in terms of the use of cannabis, proper dosage, and effective treatment plans (Thiessen et al., 2017).

The opioid crisis is appropriately addressed, in part, via communication because it began as a result of unethical communication: the rise in inappropriate opioid prescribing has been attributed to pharmaceutical marketing campaigns that “targeted doctors and professional organizations with sometimes misleading information regarding the effectiveness and dangers of OPRs” (Davis et al., 2018, p. 20). Indeed, some have argued that the U.S. should support educational efforts to reduce misunderstandings of opioid abuse, support reframing opioid abuse as a chronic disease, and adopt stronger policies regulating the marketing of drugs by pharmaceutical companies to physicians (Vokinger, 2018). In some cases, education about opioids for physicians can produce strong behavioral changes. For example, a communication intervention where provider opioid prescription rates were distributed among the provider group resulted in a decline in aggregated opioid prescription rates with some physicians demonstrating a 70% decrease in prescription rates (Guarisco & Salup, 2018).

As of 2016, no study evaluated the effectiveness of risk mitigation strategies, including patient education, for improving outcomes related to overdose, addiction,

abuse, or misuse of opioids (Dowell et al., 2016). Instead, most interventions focus on responding to those already suffering from opioid use disorder. The National Academies of Sciences, Engineering, and Medicine (2017) recommends patient and public education to reduce the demand for opioids. With pain considered the fifth vital sign, all who enter hospitals, clinics, and rehabilitation centers in the United States are confronted with the question of pain and the possibility to overcome pain through opioid use (Sherman, 2017). Communication scholars must therefore address the following research question: How can the risks and benefits of prescription opioid use be most effectively² communicated to members of the public? Given that prescription opioid use is an option for all people who enter the U.S. medical system in accordance with the Joint Commission standards that “the hospital assesses and manages the patient’s pain” (Joint Commission, 2017, p. 4), a mass-mediated education campaign may be more appropriate in scope (Noar, 2006).

Prescription opioid use presents an especially challenging case for risk communication because prescription opioids may be appropriate and necessary for some but harmful for others. Communicating both the risks and benefits of prescription opioid use is therefore ethically required to allow potential opioid users informed decision-making but message characteristics that simultaneously reduce the demand for opioids while explaining benefits and risks would be most useful in this situation. Unfortunately,

² For the purposes of this dissertation, the most effective message conveying the benefits and risks of prescription opioid use will have short-term impact resulting in longer-term health outcomes (Nutbeam, 1999). In the short term, an effective message will change individual knowledge so that patients are educated about known risks and realistic benefits of prescription opioid use (Dowell et al., 2016). In the longer term, an effective message will change individual health behaviors in that individuals will evince less intention to initiate prescription opioid use and instead will use nonpharmacologic pain therapy and nonopioid pharmacologic therapy to reduce pain and improve function (Dowell et al., 2016), or will limit the quantity and duration of prescription opioid use as recommended in clinical practice guidelines (Cheung et al., 2014; Dowell et al., 2016).

message characteristics that might engender reduced demand for opioids are currently missing in the literature. I argue that construal level theory and self-categorization may usefully frame research to inform message design that communicates the risks and benefits of prescription opioid use to members of the public in ways that reduce the demand for prescription opioids.

1.1 Theoretical Approach

Communication is the primary means of informing the public of the nature of risks and risk-mitigation behaviors (Covello, 1992). Decisions about risks and behaviors are influenced by many factors, such as literacy, systematic biases, and emotions, which complicates the effective tailoring of health messages (Huntley-Fenner, 2011; Kahneman & Tversky, 1982). However, evidence from construal level theory suggests that altering the frame of a message may change risk perceptions without changing message content (Ahn, 2015). In other words, altering the perspective from which message recipients evaluate a risk may beneficially influence their responses to risk messages.

Construal level theory (CLT; Liberman & Trope, 1998) posits that construals of events/choices/objects/persons etc. vary depending on their psychological distance from the perceiver. Given that this dissertation is concerned with messaging to influence the choice of prescription opioid use, explanation of CLT will be described using the term “choice” but other terms such as events, objects, and persons are theorized to be influenced by construal in the same way. Construals are one’s mental representation of a choice (Trope & Liberman, 2010). In other words, construals are mental models, schema, or subjective ways of understanding a choice (Trope & Liberman, 2010). Construals vary in the extent to which they are characterized by more, or less, abstract features of the

choice. Higher level construals are abstract mental models that focus on the superordinate, global, and essential characteristics of a choice. Lower level construals are concrete mental models that focus on the subordinate, situational, and incidental characteristics of a choice (Lutchyn & Yzer, 2011). Whether a choice is construed at higher or lower levels is associated with the perceiver's psychological distance from the choice. Psychological distance is an egocentric perception or "a subjective experience that something is close or far away from the self, here, and now" (Trope & Liberman, 2010, p. 440). While CLT is primarily concerned with construals of choices, objects, persons, and events external to the perceiver, the field of communication has recognized that message recipients' self-construals, alternatively termed identity or self-concept, influence their understanding of mass communication messages (see Atwell Seate, 2017; Mastro & Atwell Seate, 2012; Oliver & Krakowiak, 2009).

When tailoring messages, it is essential to understand how target audience members' identities inform their health behaviors. In this project, I define identity as mental representations of the self as a unique individual, relational partner, and member of social groups, including large superordinate groups, created and refined through communication. This definition forefronts that "identity is inherently a communication process and must be understood as a transaction in which messages and values are exchanged" (Hecht et al., 2003, p. 230). Furthermore, this definition of identity implies that individuals hold multiple identities that vary in their inclusiveness with others, meaning the extent to which the identity is unique to the individual or is shared by other people. For example, each person considering prescription opioid use has a unique personal identity as an individual, but they also hold a relational identity as a patient in

communication with their healthcare provider, and a potential identity as a member of a group of people using prescription opioids for chronic noncancer pain. Identity in the context of addictive substances has been key to understanding behavior change (Berger & Rand, 2008; Kearney & O'Sullivan, 2003) and resistance against drug abuse (Pettigrew et al., 2011). Understanding the identities implicated in prescription opioid use and what message features best target those identities to reduce the demand for prescription opioid use is a fruitful direction for reducing prescription opioid use.

Self-categorization theory (SCT; Turner, 1985) offers a framework to understand the reciprocal influence of identity and communication (Harwood, 2006). SCT posits that individuals hold various identities, termed self-categorizations, that vary in the extent to which they focus on identity as unique to an individual, identity as shared among members of social groups, or identity as shared among members of large groups that subsume other groups. In other words, these self-categorizations vary in the extent to which they are shared with others. Which of these identities becomes salient depends upon the interaction and the social environment. Identity salience refers to the degree to which an identity is the “basis for perception and self-conception” in a given situation and may vary depending on the accessibility of the identity and its contextual fit to the situation (Hogg & Reid, 2006, p. 18). In other words, an individual will take on an identity and their perceptions of a given situation will be influenced by that identity when the identity is easily brought to mind and helps to explain the social interaction in a given situation. For example, individuals who believe they have an illness perceive their symptoms to be more severe when illness group memberships are salient (St. Claire et al., 2008) and individuals evaluate others' illnesses and injuries as more or less significant

depending on which of the evaluator's group-based identities is salient (Levine & Reicher, 1996). These examples support theorizing (Harwood & Sparks, 2003) and empirical evidence (e.g., Iles et al., 2016, 2017; Stanley, 2016) that health conditions represent meaningful social identities, thus extending social identity theory to health-based social identities. Evidence suggests that the social identities made salient in communication influence risk perception (see Gibson & Zillmann, 2000; Haslam et al., 2009 for a useful review). Thus, manipulating which social identity is salient in messages communicating about a health risk may influence decisions about health risks (Harwood & Sparks, 2003). However, several key questions about the influence of identity salience on risk perception remain unanswered: 1) individuals have multiple self-categorizations that vary in the extent to which they are shared by others, how does varying the inclusiveness (i.e., individual, relational partner, group member, superordinate group member) of salient identity influence risk perceptions? and 2) does self-categorization influence risk perceptions by altering or interacting with construal level?

I argue that varying self-categorization as a message characteristic influences construal level. In other words, I propose that self-categorization influences construal of a choice to change people's responses to that choice. The following sections elaborate on CLT, in particular the relationship between psychological distance and construal level, the influence of construal level on health-relevant outcomes, and implications for message design drawn from CLT. Self-categorization is then introduced as a message characteristic that may influence construal level with a focus on the different levels of self-categorization, the reciprocal influence between identity and health, and message features that encourage certain self-categorizations.

Chapter 2: Literature Review

2.1 Construal Level Theory

Mental representations of future choices meaningfully influence the evaluations, decisions, and behaviors people make regarding said choices (Trope et al., 2007). Yet people's understandings of future choices are often incomplete and ambiguous, with different people focusing on different characteristics of the same future choice (Ahn, 2015; Liberman & Trope, 1998; Nan, 2007). CLT attempts to uncover factors affecting people's focus on certain characteristics that make up their mental representation, or construal, of future choices. Construals can be traced to Kurt Lewin's (1952) foundational field theory which assumes that reality is subjective according to each individual's life space. The life space is essentially the individual's perception of the physical world and his or her psychological state at a given point in time, all of which determine his or her behavior (Lewin, 1952). Construals are similarly mental representations of a choice that are subjective and interdependent with the psychological distance of a choice (Trope & Liberman, 2010). In other words, psychological distance can affect the construal of a choice just as the construal of a choice can affect psychological distance, though most research has focused on the former direction of influence. Thus, psychological distance and construal level influence each other, and in turn influence our decisions and behaviors. Construal levels "refer to the perception of *what* will occur" and thus should be related to the inherent properties of a choice itself (Trope & Liberman, 2010, p. 4). Psychological distance, on the other hand, refers to "perception of *when* an event occurs, *where* it occurs, to *whom* it occurs, and *whether* it occurs" (Trope & Liberman, 2010, p. 4). Thus, psychological distance is related to the

spatiotemporal distance of an event from the self. Importantly, neither the construal level of a choice nor the psychological distance of a choice is inherent to the choice itself but depend upon individual perceptions and thus can be altered (Katz & Byrne, 2013).

Understanding the factors that affect the construal of choices is important because “individuals’ judgments, decisions, and behaviors differ as a function of construal level” (Fujita et al., 2006, p. 3).

Psychological distance is one such factor that influences construal level. In fact, the central proposition of CLT is that psychological distance from a choice is a major determinant of how a person will mentally represent the choice in their minds and subsequently what characteristics will be used to evaluate it (Trope et al., 2007).

Psychological distance is defined as a subjective, ego-centric perception of how near or far an event is from the self in the here and now (Trope & Liberman, 2010). A choice is psychologically distant to some extent “whenever it is not part of one’s direct experience” (Trope et al., 2007, p. 84). This possibility will be returned to in section 2.2.2 in order to explain why varying self-categorization, despite the fact that all self-categorizations are representations of the self, influences construal level. Most research has focused on temporal distance as a form of psychological distance. Other forms of psychological distance that may affect construal level include spatial distance, hypothetical versus real events, and social distance in terms of self versus other or ingroup versus outgroup (Trope & Liberman, 2003). Social distance is driven by the perceiver’s identity in relation to others and thus may provide some clue about the influence of identity salience on risk perception. However, very little research manipulates social distance as a form of psychological distance, though Nan (2007) and

Ahn (2015) are notable exceptions that will be explained in greater detail in section 2.1.1. Increasing psychological distance diminishes the influence of low-construal features and augments the influence of high-construal features (Liberman & Trope, 1998). Specifically, more psychologically distant choices are understood at a higher construal level using more essential, decontextualized, and abstract features (Liberman & Trope, 1998). More psychologically close choices are understood at a lower construal level using more peripheral, incidental, and concrete features (Liberman & Trope, 1998). Because of these different construal levels, psychological distance from a choice influences our decisions even when information about a choice remains the same (Trope & Liberman, 2000).

The bidirectional influence of psychological distance and construal level on decisions depends on the extent to which the individual values the specific high or low construal features of a choice. For example, when an individual evaluates high-level construals (e.g., abstract characteristics of a choice) more positively than low-level construals (e.g., concrete characteristics of a choice), the attractiveness of the choice will increase as psychological distance increases (Trope & Liberman, 2000). More concretely, students will value the ease of an assignment when choosing work to be completed in the near future but will value the interest level of an assignment when choosing work to be completed in the distant future (Trope & Liberman, 2003). In this case, time is the form of psychological distance, ease of the assignment is a low-level construal, and interest in an assignment is a high-level construal. As psychological distance increased, the high-level construal of interest influenced the decision to choose a certain assignment more than the low-level construal of difficulty.

2.1.1 Construal Level Theory in Health Contexts

Recent research has demonstrated the utility of applying CLT in health communication contexts (Ahn, 2015; Nan, 2007; Lutchyn & Yzer, 2011). Health communication studies have generally provided evidence that aligns with the claims of CLT, though evidence that low level construals are more persuasive for psychologically close choices has not been supported. For example, Ahn (2015) applied CLT in order to circumvent two challenges of persuading people to quit drinking sugar-sweetened beverages: the temporal distance between engaging in the behavior and experiencing health consequences and the social distance where the individual does not feel the risk is relevant to self. In order to reduce both the social and temporal distances, Ahn (2015) used an immersive virtual environment showing either a virtual version of oneself or a virtual other drinking a sugar-sweetened beverage every day for two years and gaining weight. The immersive virtual environment was compared with a pamphlet tailored to be either self-relevant (i.e., using the term “you”) or other-focused (i.e., using the terms “they” or “people”). Messages targeting the self led to significantly lower intentions to consume sugar sweetened beverages compared to messages targeting the general public, supporting the contention that identity matters in health messages. Experiencing the virtual environment in addition to the pamphlet led to significantly lower soft drink consumption one-week post exposure compared to those who only read the pamphlet. Ultimately, regardless of the medium, tailoring the message to be self-relevant had a direct effect on social distance and intention to consume sugar-sweetened beverages such that self-relevant messages decreased perceptions of social distance and decreased intent to consume. Self-relevant tailoring also indirectly affected consumption intention through

decreased social distance, which led to increased involvement with the issue of sugar sweetened beverage consumption, and ultimately decreased intentions to consume sugar sweetened beverages. This also supports my contention that identity and self-concept matter in the context of construal level and health messages. The pamphlet plus virtual environment reduced perceived temporal distance, which led to greater perceptions of risk imminence and lower consumption of sugar sweetened beverages. Ahn (2015) noted that changes in perceived social distance seemed to drive behavioral intentions immediately post-intervention but temporal distance seemed to drive behavioral intentions one-week post-intervention.

Nan (2007) applied CLT to investigate whether altering social distance in a persuasive message changes the persuasive effect of message framing characteristics (i.e., gain/loss framing and societal/individual framing). Participants were presented with a written argument emphasizing either the positive outcome of taking a hepatitis C test (gain frame) or the negative outcome of not taking a hepatitis C test (loss frame) and asked participants to judge the value of taking a hepatitis C test for their friend (close social distance) or an average undergraduate student (far social distance). In general, participants felt that an average undergraduate student was at greater risk for hepatitis C and should therefore take a hepatitis C test more than their friend. The finding indicates that as social distance increased, perceived risk of hepatitis C increased, altering judgments about hepatitis C testing. There was an interaction for framing such that gain framing led to more favorable issue judgment in the distant condition than the proximal condition but there was no difference in issue judgment for loss framing across distance conditions. Taken together, Nan (2007) concludes that this effect was not due to an

optimistic bias, alternatively termed a self-positivity bias, a belief held by individuals that they are less susceptible to health risks than others, which may extend to socially close others as opposed to socially distant others. In a second experiment, participants were presented with a written argument emphasizing either the benefits of taking public transit for society as a whole (societal framing) or the benefits of taking public transit for the message recipient (individual framing) and asked participants to judge the value of taking public transit for themselves (close social distance) or an average undergraduate student (far social distance). In general, participants felt that taking public transportation would be more beneficial for an average undergraduate student than for themselves. There was an interaction for framing such that societal framing led to more favorable issue judgment in the distant condition compared to the proximal condition but there was no difference in the issue judgment for the individual framing across the two social distance conditions (self v. stranger).

These results suggest that a gain frame and societal frame are more persuasive when judgments are made for socially distant persons rather than close persons but loss framing and individual framing depend less on the level of social distance. If we consider gain framing as emphasizing the positive outcomes of engaging in a behavior, as Nan (2007) did, we may consider it as conceptually similar to the pros of engaging in a behavior or desirability of engaging in a behavior. In previous CLT research, pros and desirability concerns were shown to be high-level construals that are increasingly influential as psychological distance increases (Eyal et al., 2004; Lutchyn & Yzer, 2011; Trope et al., 2007). Thus, that gain framing was more persuasive as a construal level feature when judgement was for a psychologically distant other aligns with the tenants of

construal level theory. However, just as past research has failed to find that cons as low-level construals vary in their influence based on psychological distance (Lutchyn & Yzer, 2011), so too did the effectiveness of loss framing fail to vary as a result of social distance. In Lutchyn and Yzer's (2011) research, participants were asked to list all the thoughts that came to their mind when thinking about the behavior of condom use or eating fruits and vegetables either tomorrow/3 months from now/6 months from now/5 years from now. Time frame did not affect the ratio of pros/cons generated for each behavior, though it did affect the ratio of feasibility/desirability beliefs generated for each behavior, indicating that the valence of beliefs (pros/cons) may be less influenced by psychological distance compared to belief type (desirability/feasibility). Overall, Nan's (2007) finding that gain framing is more influential for psychologically distant judgments, but that loss framing does not vary based on psychological distance confirms research across several contexts.

The health communication research just reviewed demonstrates health promotive effects may occur for both high- (Nan, 2007) and low-level (Ahn, 2015) construals but research in the field of psychology tends to focus on high-level construal mindsets as health promotive, broadly speaking. High level construals may be generally more health promotive than low level construals in part because they are more concerned with the essential features of events that may spur healthy behavior (e.g., I exercise to be healthy) rather than the incidental characteristics that may impede healthy behaviors (e.g., I am tired and so will not exercise). Others have suggested that "engaging any cognitive procedure that primes high-level construals, such as superordinate categorization, global processing, and abstract or causal reasoning, may lead to greater self-control" (Fujita et

al., 2006, p. 373). Self-control is defined as “acting in line with one’s primary, central objective” (Trope et al., 2007, p. 13). In other words, placing people into a high-level construal mindset such that they focus on abstract essential features of a choice may improve their ability to act in goal-congruent ways. For example, students primed to use high level construals demonstrated greater tendency to make decisions reflecting self-control, demonstrated greater actual exertion of self-control through physical endurance, and formed stronger behavioral intentions to engage in activities requiring self-control (Fujita et al., 2006). Finally, while not directly discussing construal level per se, Trope and Liberman (2000) do propose that “people’s ideologies, moral principles, and self-identities are more likely to be expressed in distant future choices than in near future choices” (p. 888). In other words, psychological distance encourages expression of an idealistic self and increases the value placed on identity-related concerns whereas a more proximal perspective encourages expression of a pragmatic self, increasing the value of instrumental concerns (Trope et al., 2007). Thus, social psychological research suggests that inducing a high construal mindset prior to evaluating a health behavior may beneficially increase self-control and invoke a desire to align one’s behavior with one’s ideal self (Trope et al., 2007). This differs from Ahn’s (2015) finding that that reducing social and temporal distance decreased intentions to consume sugar-sweetened beverages.

The social psychological perspective of increasing construal level to increase self-control differs from the communication perspective of matching construal level message characteristics to the psychological distance of a choice to increase processing fluency. These differences represent a message design challenge, as described by Katz and Byrne (2013), that “many persuasive messages are constructed with the intention of promoting

behavioral goals, however, the theoretical constructs of congruence and self-control offer different predictions about whether the message should focus on higher level goals or specific decisions” (p. 251). Specifically, findings from social psychology suggest increasing self-control by priming high construal mindsets in order to improve health outcomes. Theorizing from communication suggests increasing message congruence and subsequent processing fluency, typically via low construal level message features that match the close psychological distance at which many choices are assessed (Katz & Byrne, 2013). Thus, it is unclear whether messages should focus on generating self-control or message congruence in order to promote health.

An additional difference between the social psychological perspective that focuses on self-control and the communication perspective that focuses on construal-level congruent message features may be whether construal level orientation, defined as one’s processing mindset, or construal level of choice, defined as “the way that one processes a particular decision” is being manipulated (Katz & Byrne, 2013, p. 249). In short, experimental manipulations of construal level matter. Communication research asks individuals to respond to construal features embedded within a message, in other words, communication researchers are altering message recipients’ construal level of the choice by altering message characteristics. As noted above, such embedded features may include pros or cons, gain frames or loss frames. Social psychological research primes individuals to construal level mindsets and then ask them to engage in behaviors or make decisions. Priming procedures occur before evaluation of the choice under consideration and are unrelated to the choice under consideration. For example, one frequently used priming procedure in CLT literature asks participants to list why (priming high level construals)

or how (priming low level construals) they engage in certain behaviors unrelated to those of interest (for example, locking a door or maintain good physical health; Fujita et al., 2006). Ultimately, social psychology researchers are altering individuals' construal level orientation or processing mindset and then asking individuals to evaluate the choice of interest. These represent two different approaches to altering construal level in ways that may affect health behaviors. In what follows, I focus on the construal level characteristics and intrinsic message features that may be embedded within a message and ultimately argue that altering message features that interact with construal level of choice is more appropriate for large-scale public health interventions than priming a construal level orientation.

2.1.2 Implications for Message Design

Researchers have begun to apply CLT in health contexts to understand how risk perception varies as a function of message content. As Nan (2007) notes, research has extended understandings of construals as representations of information in people's minds to information external to people's minds (e.g., message content) by claiming that certain message characteristics are high- or low-level construals. In other words, by their very nature, certain message characteristics construct choices in either abstract or concrete ways. Katz and Byrne (2013) similarly discuss three types of message cues that may be present in message content when using a CLT framework: abstraction, distance, and motivation cues. Abstraction cues may be perpetuated through language or images. For example, a message that focuses on why one should engage in a behavior is more abstract than a message that focuses on how to engage in that behavior. Distance cues "contains information about how psychologically close or far an item is," for example,

asking individuals to consider a policy change that will be implemented in the next 30 days or the next year is a temporal distance cue, asking individuals to consider whether their close friend or a stranger should receive a vaccination is a social distance cue. Finally, motivation cues are those relating to self-control or regulatory factors, for example, a gain frame focusing on the positive outcomes of engaging in a behavior or a loss frame focusing on the negative outcomes that will occur by failing to engage in a behavior. These message characteristics are not internal mental representations of a choice held by an individual but are external representations of a choice as described by the message creator. This expanded understanding of construals as “not only representations of information in people’s minds but also to information external to people’s minds” (Nan, 2007, p. 493) helps health communicators recognize content that exists at different construal levels and may thus influence psychological distance to enhance message processing fluency and ultimately increase message effectiveness.

Many of the construal level cues manipulated in previous research are abstraction cues. Examples of abstraction cues communicated in messages include, direction of an argument (pro vs. con), feasibility (how) and desirability (why) considerations, and primary versus secondary features (Eyal et al., 2004). Pros and cons are one manifestation of construal level that may be especially pertinent for messages communicating the risks and benefits of engaging in a behavior. Arguments in favor of future action (pros) are higher level construals than arguments against taking future action (cons) because cons are typically only considered if the pros of a behavior are sufficient, in this way, cons are subordinate to pros (Eyal et al., 2004). An increase in psychological distance should make it easier to generate pros and more difficult to

generate cons, and the ease of generating pros and cons should influence attitudes toward the activity (Trope et al., 2007). While some research has demonstrated that pros become more salient as temporal distance from the event (in this research, taking out a loan, making a hiring decision, and changing final exam procedures) increases and cons become more salient as temporal distance from the event decreases (Eyal et al., 2004), this shifting in salience of pros and cons failed to replicate in a different set of behaviors, notably, health behaviors (i.e., eating five servings of fruits and vegetables daily and using condoms during intercourse; Lutchyn & Yzer, 2011). Notably, these failures to replicate have been conceptual replications that test the hypothesis of psychological distance's effect on construal level features using different methods and thus may add nuance to the central hypothesis of CLT without entirely nullifying it.

The discrepant findings may be explained by the presence of other unknown determinants of construal level that amplify or offset each other (Eyal et al., 2004) or the familiarity of behaviors (Lutchyn & Yzer, 2011). Lutchyn and Yzer (2011) suggest that the dominant valence of public discussion may nullify psychological distance effects on the pro/con ratio generated but not influence the desirability/feasibility ratio. The pros and cons elicited, as well as desirability considerations, may be well-rehearsed beliefs that "may be simply triggered by the behavioral topic and not affected by changes in temporal perspective" whereas feasibility concerns are primarily learned through personal experience and thus are affected by temporal distance (Lutchyn & Yzer, 2011, p. 604). The highly publicized discussion around prescription opioid use and the predominant focus on negative aspects of prescription opioid use (the most common opioid-related articles from 1999-2005 focused on individuals arrested for drug selling,

prescription opioid abuse, dependence and poisoning; Dasgupta et al., 2009) introduces the possibility that the pro/con ratio that individuals generate regarding prescription opioid use may not change despite altering psychological distance.

In practice, people typically encounter health choices at low psychological distances (e.g., I must make the decision now, for myself), which means that low-level construals (such as feasibility concerns, the cons of engaging in a behavior, barriers to engaging in a behavior) are more fluently and automatically processed thus lending them more weight in decision-making (Kim et al., 2009). High-level construals (such as desirability considerations, the pros of engaging in a behavior, attitudes and subjective norm towards a behavior) are less fluently and automatically processed thus diminishing their weight in decision making. However, if the psychological distance of a decision can be altered without changing the characteristics of the decision itself then the focus on high- or low-level construal characteristics can be manipulated.

Research has demonstrated that high- or low-level construal characteristics can be manipulated in messages, however the manipulations used have altered the decision itself. For example, Nan (2007) altered the social distance of a decision by asking respondents to consider taking a hepatitis C test from the perspective of a friend (close psychological distance) or an average undergraduate student (far psychological distance). While this alters psychological distance and subsequent focus on high or low construal characteristics, the decision is altered in that the individual is not making the decision for him or herself but rather a friend or a stranger.

Self-categorization may represent an important way to manipulate construal level that unlike altering psychological distance does not change characteristics of a decision

but rather the perspective of the individual making the decision. Self-categorization is a useful perspective to explicitly integrate with CLT because the focus on abstracting representations of the self may cue changes in construal level without altering characteristics of the choice itself, which is important in health contexts where health behaviors may have specific benefits, risks, and uncertainties associated with them depending on the individual engaging in the behavior and the specifics of the behavior. Health information is the “most important resource in health care and health promotion because it is essential in guiding strategic health behaviors, treatments, and decisions,” and it is therefore important that health information remain unchanged in strategic messages aiming to influence health behaviors (Kreps et al., 1998, p. 1). This is important to consider for health contexts generally and the opioid context specifically because messages typically focus on changing attitudes as a precursor to changing behavior (O’Keefe, 2002). In order for changes in attitude to result in changes in behavior, all elements of the attitude should match the behavior. In other words, the attitude should match the desired behavior in terms of the person who would undertake the behavior, the behavior of that person, the context in which that behavior would occur, and the time at which it would occur (Ajzen & Fishbein, 1977). Ultimately, the choices presented in health communication messages should correspond as closely as possible to the choices faced by individuals in their day-to-day lives in order for attitude change to result in behavior change, which has not been the case for some CLT research.

2.2 Self-Categorization Theory

Identity is one’s understanding of the self that is enacted and altered through communication (Hecht, 1993). Scholars generally recognize that identity is not static or

singular but that the enactment of the self varies depending on contextual features of the situation. Turner (1985) captured this notion of shifting identity by describing identity on a spectrum ranging from two extremes: interpersonal behavior where interaction between two or more people is determined solely by their interpersonal relationships and individual characteristics, and intergroup behavior where interaction between two or more people is determined solely by their memberships in social groups. The latter interaction is intergroup behavior that draws on one's social identity, defined as "one's construal of self through the lens of group membership" (Greenaway et al., 2015, p. 54). Social identity refers to "the individual's knowledge that he belongs to certain social groups together with some emotional and value significance to him of the group membership" (Tajfel, 1972, p. 292). Social identity therefore derives from group membership and is constructed and refined through communication (Atwell Seate, 2017; Hecht et al., 2005). On the other end of the interpersonal-intergroup spectrum, interpersonal communication is predicated on recognition of oneself and interactional partner(s) as unique individuals, not as (social) group members. The social identity perspective helps researchers predict intergroup behavior based on comparative group status and other communicative context issues, such as similarity engendered through communication (Harwood et al., 2011). Within the social identity perspective, social identity theory is thus primarily concerned with the influence of group membership on behavior whereas self-categorization theory specifies the cognitive processes that explain intergroup behavior.

Self-categorization theory (SCT; Turner, 1985) expands on SIT to explain that individuals hold multiple cognitive representations of their selves, termed self-

categorizations. Self-categorizations are organized hierarchically by levels of increasing abstraction that indicate greater inclusiveness of categories (Turner, 1985). For example, at the least abstract level of self-categorization, I may consider myself as a unique individual different from those who I work with, thus creating an exclusive (to me) self-categorization. In a more abstract level of self-categorization, I may consider myself a University of Maryland graduate student, thus creating a self-categorization that would include others (e.g., colleagues in class). Self-categorization is theorized to occur at three increasingly abstract and inclusive levels: the subordinate, intermediate, and superordinate levels. While these self-categorizations are presented as discrete categories, they should be considered continuous. Subordinate categorization represents oneself as a unique individual different from other ingroup members, intermediate categorization represents oneself as a member of certain social groups and not others, and superordinate categorization represents oneself as a member of large supra-groups like humankind (Turner, 1985). Relational identities also fall on the continuum of identity ranging from those solely based on interpersonal characteristics to those solely based on intergroup characteristics (Tajfel & Turner, 1979). Relational identities are co-created and negotiated through roles and social interactions. Such relational identities include, for example, child, parent, romantic partner, or friend.

The central assumption of SCT is that all person perception is the result of categorization processes that produce meaning by “defining stimuli in context-dependent, relational, and self-relevant terms” (Oakes, 2003, p. 14). Thus, self-categorization occurs in all interactions in order to understand how people, events, or objects are related to the self in the specific context and guide communicative behaviors.

Figure 1*Continuum of Self-Categorization*

SCT further explains that certain self-categorizations become salient in a given interaction based on their fit with the environment and category accessibility (Haslam et al., 2009). Categorizations have better fit if they account for relevant similarities and differences between interactants (comparative fit) and account for people’s behavior (normative fit) (Abrams & Hogg, 2010). Categorizations are more accessible if they are used frequently (chronic accessibility) or if they are obviously relevant in a situation (situational accessibility) (Abrams & Hogg, 2010). Usually categorization follows the metacontrast principle and maximizes perceived similarity within and differences between categories (Hogg & Reid, 2006; Oakes, 2003; Turner, 1985). However, cues gleaned through communication can dictate which social identity is most relevant in a given context (Mastro & Atwell Seate, 2012). Specifically, “mass media exposure can play a central part in determining identity salience and even promoting category fit” and plays a role in the learning and negotiating of group attributes (Mastro & Atwell Seate, 2012, p. 364).

Using a social identity relevant to the message recipient can also influence the effectiveness of messages. For example, adolescents were presented with a print antismoking ad that contained images of the social identity (i.e., peer group identity: academics, average, deviants, elites, emo/goth, goody-goodies, hip-hop, musicians, outcasts, rockers, skaters) they identified with or not. Participants who identified more

with the group represented in the ad had stronger levels of one key antismoking belief presented in the ad, that “tobacco company executives have called young adult smokers ‘replacement smokers’” (Moran & Sussman, 2014, p. 1063). In addition to images, contextual appropriateness of self-categorizations may be manipulated via message characteristics such as priming individuals with “we” or “I,” which past research has demonstrated leads to categorization at the intermediate (i.e., social) or subordinate (i.e., personal) level respectively (Brewer & Gardner, 1996). In order to encourage more or less inclusive self-categorization, messages can refer to message recipients as members of increasingly more inclusive categories. For example, a message might refer to the recipient as a unique individual (e.g., “you”), as a group member (e.g., a student at the University of Maryland), or as a part of a larger undefined group (e.g., a member of the human species).

2.2.1 Self-Categorization Theory in Health Contexts

Health behavior change is often preceded by the recognition that the identity enacted in a particular situation does not meet one’s values and goals (Kearney & O’Sullivan, 2003). Self-categorization provides an explanation for the close relationship between identity and behavior: categorization structures our understanding of the social environment and our place within the social environment, thus guiding our behavior (Oakes, 2003). In other words, “identities are a source of expectation and motivation” that also “prescribe modes of conduct” (Hecht et al., 2005, p. 264; Hecht et al., 2003, p. 231). An intergroup approach to health that explicitly recognizes the occurrence of self-categorization helps scholars to understand not only how categorization guides health behaviors but also how one’s health status and health behaviors dictate the

categorizations that become relevant in social environments. This cyclical process of identity change and behavior is reminiscent of the process underlying behavior change in regard to addictive substances (Kearney & O'Sullivan, 2003). First, individuals recognize that their enacted identity does not match their values or goals, then they change their behavior to better align with their values or goals, and finally revise their identity in ways that better align with their values or goals. Understanding the interplay of identity and behavior may provide a more holistic understanding of the process of behavior change and identity as occurring iteratively over time.

In a theoretical extension of SCT to health contexts, Harwood and Sparks (2003) identify three levels of identity relevant to health in the context of cancer, though the propositions should hold across health contexts. First, identification with large social groups based on race, ethnicity, age, or gender identity, for example, may influence diagnosis and treatment of health conditions based on characteristics of or stereotypes linked to group membership (Harwood & Sparks, 2003). This has likely been the case for African Americans who receive less analgesics and other pain treatment than whites, even when they present at emergency departments with the same behavior and symptoms as their white counterparts (Pletcher et al., 2008; Todd et al., 2000). Second, there may be identities associated with health-related behaviors or groups that perform health behaviors. Identities associated with health-related behaviors such as anorexia may be influenced by mass communication messages. In their 2016 study, Iles and colleagues take an emotion intergroup perspective (i.e., BIAS Map) to demonstrate that stigmatizing public service announcements about eating disorders cause viewers to perceive people with eating disorders as low in warmth and competence, which increased feelings of

contempt toward them. This study demonstrates not only the degradation of an identity associated with an unhealthy behavior but also that implications of health messages can be understood from an intergroup perspective that prioritizes health communication in a context where group membership is clear. Finally, there may be identities unique to those with specific health conditions and consequences for identifying as an individual with a certain health condition. For example, identifying as a person with opioid use disorder may have positive consequences if it encourages people to seek social support and comply with medication and therapy regimens. However, identifying as a person with opioid use disorder will have negative consequences if people internalize opioid use disorder as integral to their self-concept or self-stereotype, particularly given the negative societal framing of prescription opioid use, as noted above (Harwood & Sparks, 2003; Dasgupta et al., 2009). While there is no direct evidence for this effect in relation to OUD, research on smoking cessation has shown that adult smokers who more strongly identify as smokers have lower quit intentions, more positive attitudes toward smoking, and more negative thought valence in response to anti-smoking messages (Zhao et al., 2014). Conversely, not identifying as a person with OUD despite manifesting clinical markers of OUD may result in negative outcomes if they do not perceive themselves to be addicted to opioids, disregard health messages about OUD because they believe they do not apply to them, and are thus unlikely to seek help for OUD. This is the case with “phantom smokers” in the tobacco context who smoke cigarettes but deny that they do so, perceive themselves as not being addicted to cigarettes, may not recognize themselves in cessation messages, and are unlikely to receive clinical intervention for smoking cessation (Levinson et al., 2007).

Though not addressed by Harwood and Sparks (2003), relational identities are also important to consider in health contexts because they influence health and communication behaviors (Stanley et al., 2017; Stanley & Pitts, 2018). For example, when college-age men projected into the future and envisioned themselves taking on the relationally-defined role of fathers and husbands they described themselves as being more motivated to engage in responsible partnered sexual health behaviors such as HPV vaccination in order to protect their relational partners and children (Stanley et al., 2017). Young adult cigarette and electronic-cigarette smokers co-construct their identities with friends, family, romantic interests, and employers in ways that conceal or encourage smoking (Stanley & Pitts, 2018). With close relational others like parents or romantic partners, young adult smokers demonstrated difficulty integrating the behavior of smoking into their relational identities, engaging in deception and concealing their smoking in order to keep their relational identities intact and unchanged (Stanley & Pitts, 2018).

While Harwood and Sparks theorize about both positive and negative effects that may attend self-categorization, research has demonstrated that simply “belonging to, and identifying with, important social groups can make people healthier” (Greenaway et al., 2015, p. 53). Identifying with a social group represents self-categorization at the intermediate level and the taking on of a social identity. Importantly, the type of group does not matter (e.g., racial, gender, based on health behavior), instead, the more people are socially integrated with multiple social groups rather than socially isolated or only holding one social identity the better their physical and mental wellbeing (Jetten et al., 2009). In fact, research suggests that it is simply the perception of group belonging that is health promotive regardless of how involved one actually is in the group (Jetten et al., 2010). Researchers in this area are quick to note that the mechanisms behind the link

between group membership and better health are unclear. Potential mechanisms include increased social support (Haslam et al., 2004), enhanced self-esteem (Jetten et al., 2015), increased perceived personal control (Greenaway et al., 2015), and increased knowledge of health conditions as a result of group membership (Falomir-Pichastor et al., 2009). Previous research has demonstrated that perceived personal control, what others may term self-efficacy, defined as one's subjective feeling that he or she is "capable of achieving desired outcomes," can indeed be derived from identifying as a group member (Greenaway et al., 2015, p. 54). Furthermore, perceived personal control mediates the positive relationship between group identification and wellbeing, though the effects were relatively weak³ indicating that there are likely other factors mediating the relationship between group identification and wellbeing (Greenaway et al., 2015, p. 55).

The mechanism of increased personal control is similar to self-control, a mechanism that mediates the relationship between higher construal level and health promotive outcomes (Fujita et al., 2006). Self-control is defined in construal level literature as "acting in line with one's primary, central objective" (Trope et al., 2007, p. 13), which requires "making decisions and acting in accordance with global, high-level construal of the situation rather than local, low-level construal" (Fujita et al., 2006, p. 352). Personal control, defined earlier, is the subjective feeling that one is capable of achieve desired outcomes. It may be the case that feeling one is capable of achieving desired outcomes (personal control) is aided by making decisions and acting in accordance with high-level construals (self control). Construal level may be the

³ i.e., $\beta = .018$ from group identification to wellbeing; the unstandardized indirect effect of group identification on life satisfaction through personal control = .14

mechanism between self-categorization as a group member and perceived self-control. It also suggests that subordinate self-categorization that induces low construal level and thus does not increase self control will result in fewer health benefits. Whether health benefits will be greater or lesser at higher levels of self-categorization such as superordinate categorization is less clear.

Superordinate categorization is characterized by extreme inclusiveness such that people focus on the common features they share with others, previous in-group out-group boundaries are reduced in salience, and the ingroup and outgroup coalesce into one larger group (Turner, 1985). Other theories in the intergroup arena caution that superordinate categorizations may be problematic for members of non-dominant groups (i.e., common in-group identity model) or may fail to provide the benefits that memberships in less inclusive groups may provide (i.e., optimal distinctiveness theory). For example, the superordinate category of “American” presents all of those living in America as having a common identity compared to thinking of oneself as a Chinese national, an Irish immigrant and the like. While encouraging group members to reconceive group boundaries and recategorize themselves as members of superordinate groups can reduce intergroup bias (see for example Nier et al., 2001) it may have unintended consequences by providing dimensions and norms for intergroup comparisons that may result in discrimination or inhumanization (Wenzel et al., 2008). Inhumanization occurs when people project the characteristics of their in-group onto the superordinate category and thus perceive their group to be more prototypical of the superordinate category than other groups, which is associated with negative attitudes toward the outgroup (Gaunt, 2009). In other situations, superordinate categorizations may be so inclusive that they

strip away group memberships and the benefits of group membership are lost (Abrams & Hogg, 2010). In order to avoid losing the benefits of group membership, optimal distinctiveness theory posits that individuals will choose to be members in groups that are moderately inclusive and therefore somewhat distinct (Leonardelli et al., 2010). Optimal distinctiveness theory therefore suggests that individuals will prefer more intermediate categorizations because they allow for some distinctiveness over more superordinate categorizations that may be too inclusive. Recognizing that superordinate categorization may be problematic and individuals generally prefer intermediate categorization but also that higher-level construals are believed to be more health promotive via pathways such as increased self-control, it is important to determine, therefore, whether the health protective benefits of identification at the intermediate level extend to identification at the superordinate level. Self-categorization influences construal level thus we would expect more inclusive forms of self-categorization to predict higher construal levels of an event. Whether these higher construal levels are health promotive depends upon the high and low construal characteristics of the event communicated in a message though it may not depend on message characteristics if we take the social psychological view that high construal level message promote self-control, which is associated with health promotive behaviors, at least anecdotally.

2.2.2 Self-Categorization Integrated with Construal Level Theory

Self-categorization theory should be integrated into CLT because self-categorization offers message features that can influence construal level of a choice. Theoretical perspectives rooted in the linguistic category model (LCM) provide evidence that self-categorizations change abstraction in predictable ways. The LCM approach

examines how the language that people use provides insight into their cognition. The LCM recognizes that language is the medium through which social behavior and cognition is carried out and thus that “human cognitive processes, such as perception, memory, and social inference processes vary with the structural characteristics of language” (Semin & Fiedler, 1991, p. 1). The LCM distinguishes between verb categories and adjectives ranging along the dimension of concrete to abstract: descriptive action verbs (e.g., call, meet), interpretive action verbs (e.g., help, inhibit), state action verbs (e.g., anger, amaze), state verbs (e.g., admire, hate), and adjectives (e.g., helpful, honest) (Semin & Fiedler, 1991). These different linguistic categories function as tools for use in communicative contexts in order to “drive attention” to specific elements of an event (Semin, 2008, p. 198). This is done through the use of concrete terms like action verbs, that are used to draw attention to situated, local features of an event, whereas abstract terms like adjectives direct global focus and detract from transient situated features of an event (Semin, 2008).

Linguistic intergroup bias (LIB) and linguistic expectancy bias (LEB) are two intergroup theoretical perspectives derived from the LCM paradigm that share a focus on psychological distancing through abstraction as it influences perceptions/understandings but specifically the use of language to shape group identity and stereotypes. As Maass, and colleagues (2014) note, “the linguistic representation of the very same desirable or undesirable behaviors in a concrete or abstract manner conveys different implicit meanings” about the individual and the group in which they are a member (p. 167). Specifically, as put forth in the LIB, more abstract representation of a behavior provides more information about the individual and their group and less information about the

situation whereas more concrete representation of a behavior provides more information about the situation and less information about the individual and their group. This is the reason why people use language at a higher level of abstraction when describing in-group/positive behaviors and outgroup/negative behaviors. The LEB further stipulates that language abstraction fulfills not only the function of social distancing in order to maintain positive in-group perceptions but also of maintaining stereotypic beliefs. Essentially, speakers use more abstract language when describing social group members engaging in expected behavior (i.e., when actors behave in stereotype congruent ways). These “expectancy-congruent behaviors are considered expressions of a stable, typical, and diagnostic behavior tendency of the actor” (Maas et al., 2014, p. 167). This aligns with the CLT explanation that abstract construals represent the essential characteristics of an event. Further, CLT, LIB, and LEB use the same forms of data drawn from the LCM to support their claims. Typical data collection from an LCM and CLT perspective asks participants to list descriptions of some object, event, relationship, etc. in a free-response format. Researchers then code these data using the language abstraction categories from LCM to determine the construal level of the event, in the case of CLT, or the use of language to distance others in order to promote one’s in-group and/or stereotypes about the outgroup, in the case of LIB/LEB. Thus, construal level theory and theories of social identity such as LIB/LEB and self-categorization share a focus on abstraction as altering people’s perceptions of an event, choice, context, etc.

Based on their shared conceptual and methodological histories, we may expect that self-categorization will act as a message cue that enhances focus on certain construal level characteristics. Self-categorization tethers self-concept in relation to others, just as

social distance (e.g., self vs. other, in-group vs. outgroup) creates psychological distance in relation to others. Indeed, previous research has demonstrated that activating an abstract construal mindset induces the characteristics of categorization at the group level: increased group identification, self-stereotyping, stereotype-consistent behavioral performance, and increased stereotyping of outgroup members (McCrea et al., 2012). Other research has demonstrated the influence of psychological distance on representations of the self. Increased temporal distance promotes high-level construal of the self “structured around invariant, essential self-attributes” whereas proximal perspectives promote “a low-level, more concrete construal of the self, consisting of more specific, contextualized, and unrelated features” (Wakslak et al., 2008, p. 759). Trope and Liberman (2010) further recognize that self-construal, while often more concrete than the construal of others, “may be highly abstract and high level when the self is viewed from a distanced perspective, in remote times, places, imaginary situations, and from a third-person perspective” (p. 14). This suggests that altering psychological distance to be further away is associated with abstract construals of the self (albeit still at the individual level) and altering the psychological distance to be close is associated with concrete construals of the self. Construals of the self are altered based on psychological distance. As noted earlier, the relationship between psychological distance and construal level is bidirectional meaning that, for example, “more distant objects will be construed at a higher level, and high-level construal will bring to mind more distant objects” (Trope & Liberman, 2010, p. 8). Thus, we may expect that based on previous evidence, just as altering psychological distance changes construal of the self, so too should altering

construal of the self change perceived psychological distance and construal level of a choice.

As stated in section 2.1.1, altering construal level and/or psychological distance have typically been achieved through priming procedures that occur before evaluation of the event under consideration (e.g., by asking participants to list how or why they would engage in a behavior) or by altering message characteristics that alter the event under consideration (e.g., by altering how far in the future an event would occur). Notably, while these procedures are effective at changing construal level, they are not realistic when communicating health information to the public. In other words, these are not strategies that can be used in creating mass communication campaigns nor could they be easily implemented in interpersonal communication (e.g., patient-provider). Priming procedures take time and mental effort. For example, participants in a 2006 study were presented with 40 words and asked to answer the question "... is an example of what?" or "An example of ... is what?" (Fujita et al., 2006). Given that people are cognitive misers (Fiske & Taylor, 1991; Kahneman, 2011) who do not want to spend time or mental effort processing messages, and that engaging in priming procedures would decrease processing fluency (Kim et al., 2009), including such a priming procedure in health communication messages communicated to the public at large would effectively nullify their influence.

Altering the construal level of a choice through message cues represents one alternative to priming that effectively alters construal level. Distancing a target on any psychological dimension (e.g., time, social distance, hypotheticality) also leads to greater attention to high-level construals rather than low-level construals (Fujita et al., 2006). For example, asking an individual to recommend initiating prescription opioids to a

psychologically distant person (i.e., a stranger) would result in higher-level construals of the event than asking the same individual to recommend initiating prescription opioids to a psychologically close person (i.e., a friend). Notably, a decision such as this would never actually happen in practice; people choose whether to initiate prescription opioids for themselves or for relationally close others with whom one shares meaningful identities such as children, parents, or spouses who for whatever reason are unable to initiate the process of prescription opioid use. This illustrates the central difficulty with applying CLT to messaging about choices: most psychological distance dimensions (e.g., space, hypotheticality, time) that may be altered to change construal level also require information about the choice to be altered. Altering health information in manipulations reduces the ecological validity of the research, which requires “faithfully operationalizing key variables and study conditions to mirror (as much as possible) the realities of health care delivery” (Kreps, 2001, p. 599).

Self-categorization represents a previously untested message cue that may influence construal level without altering the characteristics of the event. Despite self-categorization being focused on mental representations of the self and thus always socially near to some extent to oneself, theorizing from Trope and Liberman (2010) suggests that even direct experiences by the individual can vary in the extent to which they are psychologically close to the individual. While the egocentric perception of psychological distance has been conceptualized at the starting point of me in the here and now, Trope and Liberman (2010) suggest that this may be oversimplified because “some direct experiences may be more proximal than others” (p. 28). They give the example of the five senses: taste, touch, sight, sound, and smell and argue that, for example, touch is

a more proximal direct experience that requires nearness to an object as compared to sight which allows the scope of perception to be extended to far-away objects (Trope & Liberman, 2010). I argue that self-categorizations, while rooted in the self and thus direct experiences, may vary in the extent to which they are proximal to direct experience. For example, when asked to consider the choice of teaching a summer class as an individual I may respond based on highly proximal, concrete, and situational experiences unique to myself, such as the number of weddings I have to attend during the summer. When asked to consider the choice of teaching a summer class as a graduate student, I am likely to respond based on less proximal experiences to myself but rather essential features of summer teaching that I instead believe may be shared by other graduate students, such as the benefit of increased income and teaching experience.

Self-categorizations offer a further benefit as cues that influence construal level in that they may be particularly amenable to altering via messages because social identities are themselves self construals that are influenced by communication and are “potentially fluid and negotiable” (Greenaway et al., 2016, p. 29). Self-categorizations can also be altered via language. As Abrams and Hogg (2010) note, “language, with its strong cultural and historical roots, is one of the most potent symbols of identity” (p. 189). As Maass and colleagues note (2014) language tools, including pronouns, “guide social categorization, creating sub- and superordinate categories” (p. 171). Pronouns act as tools that “reflect people’s social (vs. personal) identity and that maintain intergroup differences” though reactions to such pronouns may be unconscious (Maass et al., 2014, p. 169). First-person singular pronouns (e.g., I or me) signal a focus on the self, whereas first-person plural pronouns (e.g., we or us) signal a focus on the collective (Maass et al.,

2014). Third-person pronouns (e.g., they) refer to targets that do not include the self. Manipulating the target's level of self-categorization to be more inclusive via the use of pronouns in a message may induce a focus on higher level construals without changing the nature of the choice.

2.3 Theory of Planned Behavior from an Intergroup Perspective

I have argued that self-categorization and CLT should be integrated to provide message cues that change the construal level of a choice and affect behavioral decisions. The theory of planned behavior (TPB) is a frequently used behavioral decision-making model that can more closely tie predictions based on SCT and CLT to behavioral outcomes. In this section, I will provide an overview of TPB and present evidence of its usefulness in predicting behavioral intention and behavior relevant to prescription opioid use. Then I will unpack each of the proximal determinants of behavioral intention and explain how they may be influenced as a result of altering self-categorization.

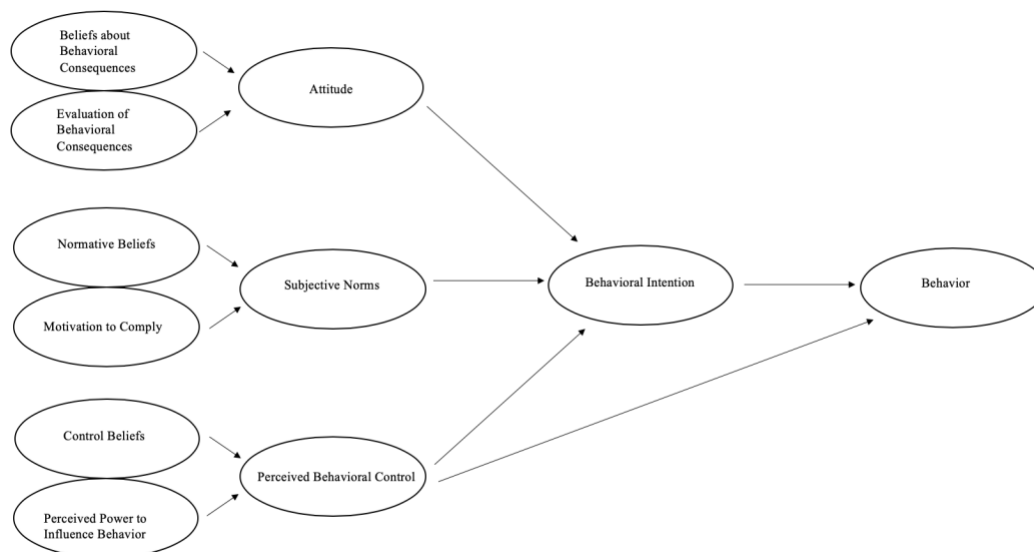
TPB (Ajzen, 1991) is a behavioral decision-making model⁴ that is based on the assumption that actions are controlled by behavioral intentions. In other words, intention to engage in a behavior is a direct antecedent of overt behavior (Ajzen & Fishbein, 1970). Behavioral intention is defined as “self-instructions to perform particular behaviors or to obtain certain outcomes” (Webb & Sheeran, 2006, p. 249). Thus, according to TPB, behavioral intention directly predicts behavior such that the stronger the intention to engage in a behavior, the more likely the behavior is to be performed, a relationship supported by meta-analyses (Conner & Sparks, 2005; Webb & Sheeran, 2006). The

⁴ I use the term behavioral decision-making model to denote that the TPB illustrates the process through which individuals are theorized to make choices that ultimately are carried out in their behaviors.

proximal determinants of behavioral intention, which will be defined in the following paragraphs, are the person's attitude toward performing the behavior, subjective norm about the behavior, and perceived behavioral control. Perceived behavioral control also directly influences behavior. The TPB has been used to predict behavioral intentions in the prescription opioid use context (e.g., Pellino, 1998; Rieckmann et al., 2007) and explains a significant amount of variance in intentions to use licit and illicit drugs (Armitage et al., 1999; McMillan & Conner, 2003). Therefore, the TPB is an appropriate theory to investigate behavioral intention to use prescription opioids and understand the proximal determinants of behavioral intention.

Figure 2

Conceptual Model of the Theory of Planned Behavior



All proximal determinants are theorized at the subordinate level of self-categorization as being influenced by the individual's salient beliefs about the behavior (Ajzen, 1991; Ajzen et al., 2011). While salient beliefs undoubtedly do influence the proximal predictors of behavioral intention, if the individual self-categorizes at different

levels than the subordinate, different beliefs may become salient or the weighting of the proximal predictors may change, thus changing the individual's behavioral intention. Notably, beliefs in the TPB are not assumed to be rationally formed or unbiased, accurate depictions of reality (Ajzen, 2011). Instead, beliefs are subject to bias, emotions, and faulty premises so they may not accurately reflect reality. Furthermore, there is no assumption that "people carefully and systematically review all available information before they form an intention to engage in a behavior" (Ajzen, 2011, p. 1121). TPB does assume that individuals' attitudes, subjective norm, and perceived behavioral control "follow automatically and consistently from their beliefs" (Ajzen, 2011, p. 1116), meaning that regardless of the accuracy of an individual's beliefs, their behavior is reasoned or planned to the extent that the proximal predictors of behavioral intention are derived from their beliefs.

TPB predicts the performance of behaviors that are outside of voluntary control or that are difficult to perform. Voluntary, also termed volitional, behaviors are "behaviors over which the individual has a good deal of control" (Webb & Sheeran, 2006, p. 249). In contrast, the TPB predicts behaviors that the individual may not believe are under their personal control or that they may not actually have control over due to factors such as resources, skills, opportunities, behavioral complexity, or cooperation needed to successfully perform behaviors (Webb & Sheeran, 2006). Examples of behaviors that are outside of voluntary control or that are difficult to perform include exercising, losing weight, smoking cessation, and complying with medication regimens. Despite the complexity of engaging in nonvolitional or difficult behaviors, the TPB is able to explain variance in these behaviors. For example, attitudes, subjective norm, and perceived

behavioral control have explained variances in intentions to drink alcohol and illegally use cannabis (Armitage et al., 1999), use tobacco (McMillan & Conner, 2003), and adhere to treatment for various chronic illnesses such as diabetes, heart disease, and psychiatric illness (Rich et al., 2015).

Furthermore, elements of the TPB have also been used to explore intentions and behaviors regarding opioid administration and use. For example, clients' and counselors' willingness to use certain prescription medications (e.g., methadone, buprenorphine) to treat opiate dependence in drug treatment programs primarily depended on their perceived social norms regarding the use of prescription medications though attitudes also significantly influenced intention to use certain medications (Rieckmann et al., 2007). Notably, in this study, perceived behavioral control was not measured. In a study of adults undergoing elective orthopedic surgery, patients who had more positive attitudes and accepting subjective norm toward taking pain medication intended to take more than those who had negative attitudes and less accepting subjective norm (Pellino, 1998). In this context, perceived behavioral control was not related to intention to use pain medication (Pellino, 1998). However, in a meta-analysis of TPB studies categorized by behavior type, across 18 studies examining drug use (e.g., alcohol and tobacco use, use of illicit drugs) perceived behavioral control was the strongest predictor of intention to use and subjective norm the weakest (McEachan et al., 2005). In total, the proximal determinants of behavioral intention, attitudes, subjective norms, and perceived behavioral control, explained an average of 53% of variance in intentions to use drugs (Conner & Sparks, 2005). Behavioral intention and perceived behavioral control predicted on average 39% of the variance in behavior (Conner & Sparks, 2005). Thus, the

TPB is an appropriate theory to examine individuals' behavioral intentions regarding the initiation of prescription opioid use and to understand the proximal determinants of intention to initiate prescription opioid use.

The extent to which the proximal determinants of behavioral intention correlate with each other and behavioral intent and behavior varies. The average multiple correlation of attitude, subjective norm, and perceived behavioral control with intention is $R = .63$ accounting for 39% of the variance in intention (Armitage & Conner, 2001). In a more recent meta-analysis of TPB meta-analyses, attitude, subjective norm, and perceived behavioral control accounted for 33.7% of the variance in behavioral intention across studies (Conner & Sparks, 2005). Perceived behavioral control and behavioral intention accounted for 25.6% of the variance in behavior (Conner & Sparks, 2005). In terms of effect sizes based on sample-weighted mean correlations, the intention-behavior and attitude-intention relationships have large effect sizes ($r = 0.5$), most other relationships were in the medium ($r = 0.3$) to large ($r = 0.5$) effect size range, and the subjective norm-behavior relationship was the only relationship to fall in the medium ($r = 0.3$) to small ($r = 0.1$) effect size range (Conner & Sparks, 2005). Across meta-analyses, the variance explained in behavioral intention by attitude, subjective norm, and perceived behavioral control ranges from 40 to 50% (Conner & Sparks, 2005). In terms of the influence of behavioral intention on behavior, a meta-analysis of 47 intervention studies found that interventions, on average, have a medium-to-large (sample-weighted average effect size $d = .66$) effect size on intention (Webb & Sheeran, 2006). In turn, interventions that had a medium-to-large effect on intentions, on average, led to a small-to-medium (sample-weighted average effect size $d = .36$) change in behavior (Webb &

Sheeran, 2006). Behavioral intention is a better predictor of behavior when the behavior is perceived to be or is actually under greater control of the individual and when the intention concerns a health-protective rather than a health-risk behavior (Webb & Sheeran, 2006). Table 1 below provides correlations between the TPB constructs from several meta-analyses.

Table 1

Theory of Planned Behavior Correlations from Meta-Analyses

	Definition	ATT	SN	PBC	BI	B	BI+PBC	ATT+SN+PBC
Attitudes	Degree to which a person has a favorable or unfavorable evaluation toward performing the behavior.	---						
Subjective Norms	Perceived social pressure to perform or not to perform the behavior.	.36 _b .36 _c	---					
Perceived Behavioral Control	Perceived ease or difficulty of performing the behavior.	.25 _b .41 _c	.14 _b .26 _c	---				
Behavioral Intention	Intent to perform the behavior.	.49 _a .50 _b .51 _c	.34 _a .39 _b .34 _c	.43 _a .35 _b .43 _c	---			.63 _a

Behavior	Performance of the behavior.	.36 _c	.16 _c	.37 _a	.47 _a	--	.52 _a
				.35 _c	.48 _c	-	

Note. BI = behavioral intention; PBC = perceived behavioral control; ATT = attitude; SN = subjective norm.

^a Correlations from Armitage and Conner, 2001. ^b Correlations from Rise et al., 2010. ^c Sample-weighted mean correlations from Conner and Sparks, 2005.

While TPB has explanatory power (Armitage & Conner, 2001), researchers have theorized (Conner & Armitage, 1998; O’Keefe, 2002) and empirically investigated (Sparks & Shepherd, 1992; Terry et al., 1999) self-identity as an additional proximal determinant of behavioral intention. Self-identity, alternately termed self-concept (Sparks & Shepherd, 1992), has various definitions in TPB research, including some salient facet of an individual’s self-perception, “the extent to which performing the behavior is an important component of a person’s self-concept” (Terry et al., 1999, p. 226), or “the salient part of an actor’s self which relates to a particular behavior” (Conner & Armitage, 1998, p. 1444). Self-identity has significantly predicted behavioral intention to consume organic vegetables and recycle (Sparks & Shepherd, 1992; Terry et al., 1999).

While self-identity is a useful addition to the TPB, there is little evidence of how to engage receivers’ self-identities or the relative efficacy of various means of doing so (see Pratkanis, 2000). O’Keefe (2002) suggests that in order to create change in behavioral intention, one might attempt to create a new self-identity for the individual or engage some existing self-identity. The idea of creating a new self-identity or engaging an existing self-identity is premised on the belief that “people may be motivated by their need to maintain their self-concept” (Conner & Armitage, 1998, p. 1445). As theorized in self-categorization theory, there are varying levels of the self and which self-concept becomes salient varies depending upon the accessibility and environmental fit of an

identity. Thus, message cues indicating an accessible and appropriate self-categorization may motivate a desire to maintain the self-concept informed by the cued self-categorization (Haslam et al., 2009; Hogg & Reid, 2006). The social identities suggested by message cues are “cognitively represented as group prototypes that describe and prescribe beliefs, attitudes, feelings, and behaviors” that maximize between-group differences and minimize ingroup differences (Terry et al., 1999, p. 228). In other words, prototypes cognitively represent social groups as fuzzy sets of attributes that “define one group and distinguish it from others” (Hogg & Reid, 2006, p. 10). Thus, unlike research integrating self-identity with TPB that includes self-identity as an additional proximal predictor of behavioral intention distinct from the other predictors, I suggest that self-categorization influences the individual’s beliefs underlying his or her attitudes, subjective norms, and perceived behavioral control, and the extent to which each of these proximal predictors influences behavioral intention.

The theorized influence of self-categorization on an individuals’ beliefs aligns with construal level theory. When investigated from a construal level perspective, normative and attitudinal beliefs were posited to be high-level construals and control beliefs were posited to be low-level construals (Lutchyn & Yzer, 2011). Indeed, when temporal distance was altered participants generated more control beliefs in the close temporal condition and more attitudinal and normative beliefs in the distant temporal conditions (Lutchyn & Yzer, 2011). This finding suggests that as psychological distance increases, which may be achieved through increasing the inclusivity self-categorization, more beliefs underlying attitudes and subjective norms will be made salient than beliefs underlying perceived behavioral control. Changes in the beliefs underlying the proximal

determinants should result in changes to behavioral intention and ultimately, behaviors. Each of the proximal determinants will be described in greater depth as they were originally conceptualized in the TPB and in terms of how they may vary when viewed from an intergroup rather than a personal level of identity.

2.3.1 Attitude toward the Behavior

Attitude toward the behavior is defined as the degree to which a person has a favorable or unfavorable evaluation or appraisal toward performing the behavior in question (e.g., “For me, starting to use prescription opioids would be good/bad”). In their seminal article, Ajzen and Fishbein (1977) articulated that attitudes and behaviors consist of an action, a target at whom the action is directed, the context in which the action takes place, and the time at which the action takes place. Attitudes better predict behavior to the extent that these behavioral and attitudinal elements correspond to each other (Ajzen & Fishbein, 1977). Attitudes toward a behavior are influenced by behavioral beliefs about the value of attributes linked to a behavior. When the attitude is toward an act (e.g. initiating prescription opioid use) rather than an object, attitudes are calculated based on beliefs about the consequences of performing the act and the subjective evaluation of those consequences (Ajzen & Fishbein, 1970). Ultimately, attitudes are based on beliefs about the characteristics or consequences of an object or behavior and the individuals’ evaluation (e.g., good/bad, favorable/unfavorable) of the believed characteristics or consequences.

O’Keefe (2002) suggests four ways messages can change one’s attitude towards a behavior: adding a new salient positive or negative belief regarding the behavior, increasing the (un)favorability of existing positive or negative beliefs, increasing or

decreasing the strength of an existing belief, or changing the relative salience of currently held beliefs. Altering one's self-categorization may facilitate such belief-based attitude change. As discussed in section 2.2.2, if self-categorization influences construal level, then as self-categorization becomes more inclusive (e.g., moving from individual to group member), the individual will generate more higher-level construal beliefs (e.g., pros, desirability beliefs) regarding the decision. As self-categorization becomes less inclusive (e.g., moving from group member to individual), the individual will generate more lower-level construal beliefs (e.g., cons, feasibility beliefs) regarding the decision. Thus, changing one's level of self-categorization should result in altering the salience of currently held beliefs and the addition of new salient positive or negative beliefs regarding the behavior, all of which may change one's attitude toward the behavior. For example, college-age males cued to assess Human Papillomavirus (HPV) vaccination from the perspective of their group membership as college males evinced ambivalent attitudes toward vaccinating against HPV. They cited behavioral beliefs that college males are highly sexually active but uninformed about sexual health and so unable to take on sexual health responsibility equal to college women (Stanley et al., 2017). When these same college males imagined themselves taking on the relationally-defined role of fathers and husbands, they evinced more positive attitudes toward HPV vaccination as a way to protect their future wives and children (Stanley et al., 2017). Ultimately, shifting from an intermediate categorization to a relational categorization changed the salient behavioral beliefs about HPV vaccination for these college males and their behavioral intentions, illustrating the usefulness of self-categorization for changing attitudes in health contexts.

Additionally, O'Keefe (2002) suggests that changing the relative weighting of attitudes and subjective norms may influence behavioral intention. Specifically, if an individuals' attitudes and subjective norms are conflicting regarding a behavior (e.g., pain relief is good, but my partner does not want me to take prescription opioids), encouraging attitudes or subjective norms to be more influential in decision-making may be a useful strategy to change behavioral intention. This may be achieved by changing the message recipient's self-categorization. Previous research suggests that individuals cued to self-categorize at the subordinate level (i.e., as unique individuals) will be more influenced by personal constructs (i.e., attitudes and perceived behavioral control) than group-based constructs (i.e., perceived subjective norms) (Terry & Hogg, 1996; Terry et al., 1999). Therefore, the relative influence of attitudes, norms, and perceived behavioral control on behavioral intentions should vary depending upon the individual's level of self-categorization.

In addition to affecting the relative influence of attitudes on behavioral intention, Terry and Hogg (1996) argued that self-categorization should influence the behavioral beliefs underlying attitudes. Terry and Hogg (1996) stated that SCT predicts that group membership should influence people's attitudes and that attitudes can be "personal and idiosyncratic and unrelated to group norms but they can also be widely shared and normative" (p. 780). For example, Terry and Hogg (1996) found a significant positive correlation between attitude and group norm regarding the intention to exercise regularly. It may be the case that attitudes are only expressed in behavioral intention when subjective norms and attitudes are aligned, a phenomenon called contingent consistency (Terry & Hogg, 1996). Put differently, "an attitude will be expressed behaviorally only

when a supportive normative environment exists” (Terry & Hogg, 1996, p. 778). In summarizing, the behavioral beliefs underlying attitudes, the effect size of attitudes on behavioral intention, and whether attitudes are expressed in behavioral intentions are influenced by self-categorization.

2.3.2 Subjective Norm toward the Behavior

Subjective norm toward the behavior is defined as perceived social pressure to perform or not to perform the behavior (e.g., “Most people who are important to me think that I should/should not start using prescription opioids”). Subjective norms are determined by normative beliefs, which focus on the likelihood that important referent individuals or groups approve or disapprove of performing a given behavior. The strength of each normative belief is multiplied by the person’s motivation to comply with the referent(s) in question (Ajzen, 1985). The influence of subjective norms on behavior is thought to result from people conforming to subjective norms out of fear of being rejected by significant others, in other words, in order to avoid external sanctions (Rise, et al., 2010).

In order to change the subjective norm regarding a behavior, O’Keefe (2002) recommends adding a new referent or changing the salience of an existing referent. Such tasks may be facilitated via message cues that make a specific self-categorization salient. In fact, Terry et al. (1999) predicted that if a social identity becomes salient to an individual in performance of a behavior, then the individual will become more like the group prototype by acting in line with perceived group norms. Thus, for individuals who identify strongly with the group, group norms will mediate the relationship between social identity and behavioral intention, whereas for those who do not identify with the

group, their personal attitudes should more strongly influence behavioral intention than perceived group norms. Indeed, Terry et al. (1999) found that the perceived norm of a behavior-relevant reference group was related to behavioral intent to recycle only among those who strongly identified with the reference group. Similarly, Johnston and White (2003) found that the effect of group norms on behavioral intention to binge drink depended upon the strength of group identification such that group norms had a stronger effect on binge drinking intentions among participants who strongly identified with the ingroup. Furthermore, Terry et al. (1999) found that “the relationship between group norms and intentions (for the high identifiers) is independent of the extent to which performing the behavioral role is a central component of the person’s self-conception” (p. 239). Thus, we may expect that among individuals who are cued to self-categorize at the relational, intermediate, or superordinate level, the influence of subjective norms on behavioral intent will be greater than among individuals who are cued to self-categorize at the subordinate level.

2.3.3 Perceived Behavioral Control over the Behavior

Perceived behavioral control is defined as the perceived ease or difficulty of performing the behavior (e.g., “For me, starting to use prescription opioids would be easy/difficult”). Perceived behavioral control is theorized as reflecting the individual’s past experiences with the behavior and anticipated impediments and barriers (Ajzen, 1991). Control beliefs are the basis of perceived behavioral control and refer to beliefs about the presence or absence of needed resources and opportunities multiplied by the perceived power of the control factor to facilitate or impede performance of the behavior (O’Keefe, 2002). These control beliefs are based on previous experiences with the

behavior, second-hand information about the behavior, experiences of friends, and other factors that change the perceived difficulty of engaging in the behavior (Ajzen, 1991).

As reviewed in section 2.2.1, personal control, defined as an one's subjective feeling that he or she is "capable of achieving desired outcomes," can be derived from categorizing at the intermediate level (Greenaway et al., 2015). Furthermore, self-control, defined as "acting in line with one's primary, central objective" (Trope et al., 2007, p. 13), mediates the relationship between higher construal level and health promotive outcomes (Fujita et al., 2006). Thus, based on research from social psychology, we may expect that as the level of self-categorization becomes more inclusive, personal control will increase.

However, research suggests that the influence of perceived behavioral control on behavioral intention may diminish as a result of increasing levels of self-categorization. In testing identity as an additional predictor of behavioral intention, Terry et al. (1999) described perceived behavioral control as an individual construct. Specifically, they argued that perceived behavioral control should more strongly influence behavioral intention when performance of a behavior is considered from a personal identity rather than a group-based identity. Indeed, the relationship between perceived behavioral control and behavioral intention was stronger for individuals who weakly identified with the reference groups in the study (i.e., friends, peers), compared to the strong identifiers (Terry & Hogg, 1996; Terry et al., 1999). Based on this evidence, we can conclude that when individuals self-categorize at higher group-level identities their perceived behavioral control should increase as a result of increased self-control. At the same time, the influence of perceived behavioral control on behavioral intention should diminish as

the level of self-categorization increases because it is an individual construct that should be less relevant when behavioral decisions are made from the perspective of a group member.

2.4 Rationale

In this section, I will remind readers of the arguments presented in the literature review and propose a research question, hypotheses, and models. The basic premise of this dissertation is that changing the construal level of a choice influences beliefs regarding that choice. Altered construal level is evident in the types of beliefs elicited, however there is little empirical evidence regarding the beliefs that U.S. adults hold about prescription opioid use. Thus, the research question examines the themes of beliefs elicited regarding initiating prescription opioid use.

Research Question: What themes characterize participants' beliefs about the feasibility and desirability of initiating prescription opioid use?

Hypothesis 1 turns from a focus on the themes of beliefs about prescription opioid use to the types of beliefs elicited by people considering prescription opioid use at different levels of self-categorization. Research has shown that altering construal level influences one's understanding of the self (McCrea et al., 2012). This suggests that conversely altering understanding of oneself by manipulating self-categorization will influence construal level. Altered construal level is evident in the belief types elicited. Pro/con beliefs and feasibility/desirability beliefs are two manifestations of construal level that covary with perceived psychological distance (Eyal et al., 2004; Lutchyn & Yzer, 2011; Trope et al., 2007). Desirability beliefs are higher construal level beliefs than feasibility beliefs, and pro beliefs are higher construal level beliefs than con beliefs. For

example, Eyal and colleagues (2004) demonstrated that considerations against an action (cons) are indeed subordinate to pros (considerations in favor of the action) because cons are only considered if the pros are deemed to be sufficient to merit further consideration of the behavior. This property has been described as asymmetric conditional importance, meaning that “the importance of the low-level aspects is dependent on the value of the high-level aspects more than the importance of the high-level aspects is dependent on the value of the low-level aspects” (Eyal et al., 2004, p. 782). In line with theorizing about CLT, Eyal et al. (2004), and Lutchyn and Yzer (2011), I propose the following hypotheses:

Hypothesis 1: Self-categorization at increasingly inclusive levels (i.e., moving from subordinate categorizations to relational, intermediate, and superordinate categorizations) is positively associated with desirability beliefs and negatively associated with feasibility beliefs.

Hypothesis 2: Self-categorization at increasingly inclusive levels (i.e., moving from subordinate categorizations to relational, intermediate, and superordinate categorizations) is positively associated with pro focus and negatively associated with con focus.

Self-categorization is theorized as a message cue that influences not only construal level but also psychological distance of a choice. Self-categorization places oneself in relation to others (e.g., unique from others, members of the same group, part of the same species) just as social distance creates psychological distance in relation to others. Previous research has demonstrated that psychological distance in the form of time influences construal level of the self (Wakslak et al., 2008). Remembering that the

relationship between construal level and psychological distance is bidirectional (Trope & Liberman, 2008), we may conclude that just as self-categorization (i.e., construal level of the self) is altered by psychological distance, so too should self-categorization alter psychological distance. Specifically, I hypothesize the following.

Hypothesis 3: Self-categorization at increasingly inclusive levels (i.e., moving from subordinate categorizations to relational, intermediate, and superordinate categorizations) increases psychological distance.

Ultimately, I was uncertain about the causal direction between psychological distance and construal level as manifested in pro and con beliefs. The relationship between psychological distance and construal level is bidirectional meaning that, for example, “more distant objects will be construed at a higher level, and high-level construal will bring to mind more distant objects” (Trope & Liberman, 2010, p. 8). Therefore, I propose three potential models, all of which ultimately predict the likelihood of using prescription opioids (see Figures 3-5). Furthermore, I modeled the relationship between self-categorization, construal level, and psychological distance as occurring through the mediating role of identity salience. In these models, identity salience is conceptualized as a potentially mediating psychological outcome between the intrinsic message feature (i.e., self-categorization) and the outcomes of construal level focus and psychological distance (O’Keefe, 2003). Unless the manipulated self-categorization is salient, as captured by the identity salience measure, it will not function as an intrinsic message feature.

Figure 3

Serial Mediation where Psychological Distance Predicts Pro Focus and Con Focus

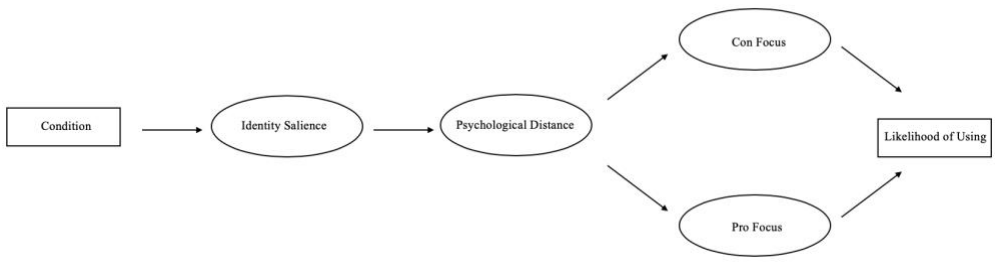


Figure 4

Serial Mediation where Identity Salience, Pro Focus, and Con Focus Predict Psychological Distance

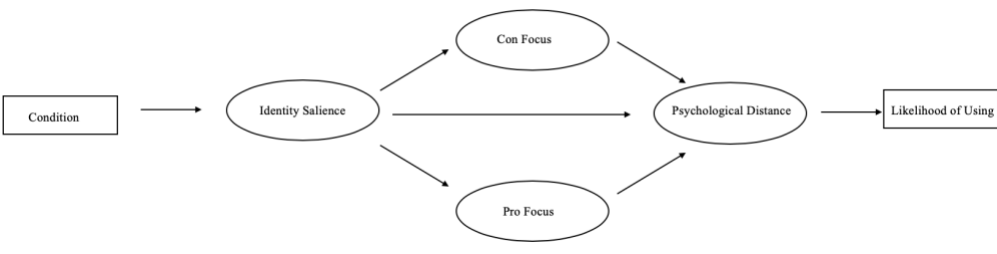
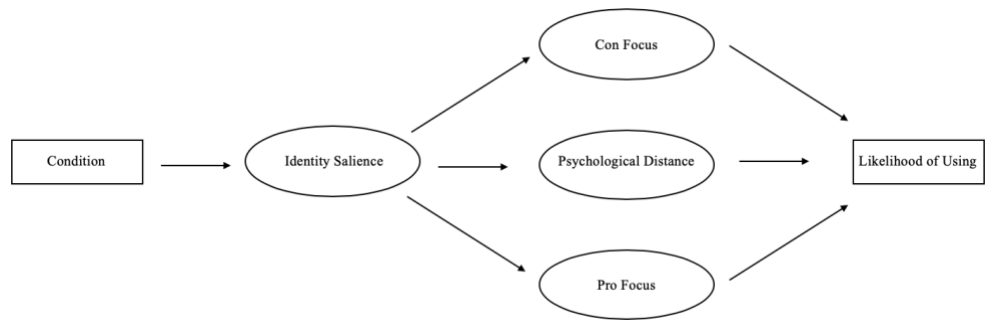


Figure 5

Serial Mediation where Identity Salience Predicts Pro Focus, Con Focus, and Psychological Distance



The previous hypotheses examine the influence of self-categorization on elicited construal level beliefs about prescription opioids. The following hypotheses examine the indirect influence of self-categorization manipulated in a message containing both high

(pro) and low (con) construal level beliefs on the proximal predictors of prescription opioid use through identity salience. Specifically, these hypotheses are situated within the TPB (see section 2.3). The importance of identity salience was evident in study 1, where self-categorization significantly indirectly predicted pro focus through the mediating factor of identity salience.

Self-categorization may influence which construal-level aspects of a message (e.g., pros or cons) have greater influence on the proximal determinants of behavioral intention. Thus, self-categorization may be altered to focus attention on the construal level characteristic of pros or cons. Specifically, I hypothesize that individuals exposed to messages with relational and superordinate distance cues will exhibit more positive attitudes towards initiating prescription opioid use. Recall hypotheses 1 and 2. As argued in support of those hypotheses, if self-categorization acts a message cue that influences construal level, that influence will be evident in changes in belief type and belief valence. Specifically, self-categorizing at more inclusive levels will increase construal level as evinced by greater focus on desirability and pro beliefs and reduced focus on feasibility and con beliefs. Increased focus on positively valenced beliefs (i.e., pros) should result in more positive attitudes toward prescription opioid use. Therefore, I propose the following hypothesis.

Hypothesis 4: Self-categorization at increasingly inclusive levels (i.e., moving from subordinate categorization to relational and superordinate categorizations) indirectly predicts more positive attitudes toward prescription opioid use through the mediating role of identity salience.

Subjective norm is defined as “one’s general perception of whether important others desire the performance or nonperformance of the behavior” (O’Keefe, 2002, p. 102). Who the “important others” one bases their subjective norm upon likely depends on one’s self-categorization. People who self-categorize at the superordinate level of human being will likely formulate subjective norms based on their perceptions of larger more abstract groups such as humankind. Given that opioid use has been described as a “national public health emergency” (Christie et al., 2017, p. 5) it seems likely that there is a negative relationship between self-categorization and subjective norm, meaning that as self-categorization becomes more inclusive, subjective norm become more negative. On the other hand, those who self-categorize at the relational and individual levels likely build their subjective norms based on their perception of specific people in their life, for example, their partner, parent, or friend rather than the perceived norms of more abstract groups. These specific individual influences likely have more idiosyncratic beliefs regarding prescription opioid use and so while subjective norm toward prescription opioid use may still be negative, it is likely that the perceived negative subjective norm will be weaker for those at the individual and relational self-categorization than for those self-categorizing at the intermediate and superordinate levels given the widespread negative coverage of prescription opioids (Dasgupta et al., 2009).

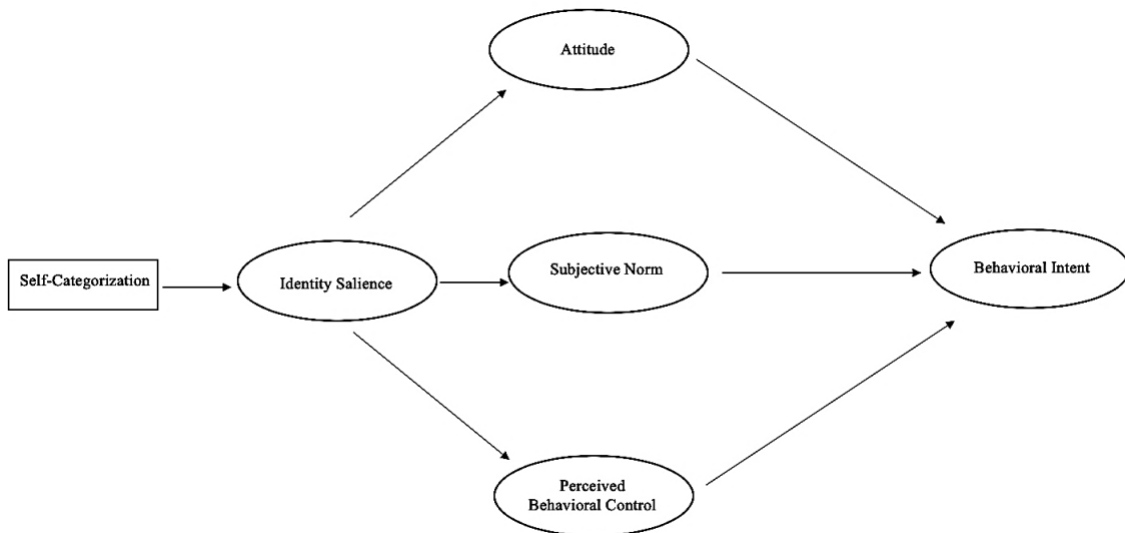
Hypothesis 5: Self-categorization at increasingly inclusive levels (i.e., moving from subordinate categorizations to relational and superordinate categorizations) indirectly predicts negative subjective norms through the mediating role of identity salience.

Finally, increasing the level of self-categorization increases individuals' feelings of self-control, thus I hypothesize that as the level of self-categorization increases, perceived behavioral control over initiating prescription opioids increases.

Hypothesis 6: Self-categorization at increasingly inclusive levels (i.e., moving from subordinate categorizations to relational and superordinate categorizations) indirectly positively predicts perceived behavioral control over prescription opioid use through the mediating role of identity salience.

Figure 6

Serial Mediation of Self-Categorization's Effect on Behavioral Intention by Identity Salience, Attitudes, Subjective Norms, and Perceived Behavioral Control



Chapter 3: Pilot Study 1

This dissertation consists of two pilot studies and two main studies. Pilot study 1 collected a pool of beliefs about prescription opioid use from participants in order to construct measures of the extent to which certain considerations influence participants' decision making about prescription opioid use. Pilot study 1 answered, in part, the research question concerning participants' beliefs about prescription opioid use. For pilot study one and study one, thought listing and responses to survey questions were used as data collection methods. Many studies investigating construal level theory have used thought listing (e.g., Eyal et al., 2000; Lutchyn & Yzer, 2011) because of the lack of quantitative measures of construal level.

Given that previous research has put forth relational identities as important to consider in health contexts (e.g., Stanley & Pitts, 2018; Stanley et al., 2017; Nan, 2007), and in intergroup contexts (e.g., Brewer & Gardner, 1996), the pilot study was undertaken to understand which, if any, relational identities were relevant to participants in thinking about prescription opioid use and understand their thoughts about prescription opioid use. The procedures were approved by the University of Maryland Institutional Review Board on July 15, 2019. Participants were recruited from Amazon Mechanical Turk and provided data for the pilot study July 16-23, 2019.

3.1 Amazon Mechanical Turk

Across all studies, participants were recruited from Amazon Mechanical Turk (MTurk). MTurk is a crowdsourcing marketplace that allows individuals and businesses (i.e., requesters) to interact with global workers 24/7 to complete tasks, including survey participation ("Features," 2018). Requesters create a Human Intelligence Task (HIT),

which workers can find and submit responses to for compensation (see Appendix A). MTurk workers were selected to participate in this research because they are arguably more representative of the U.S. population as a whole than participants from University subject pools, recruitment of participants is generally fast, and participants can be prescreened for certain characteristics (e.g., location) such that a HIT is only visible to those workers who meet predefined criteria (Paolacci et al., 2010).

Furthermore, the MTurk interface has a lower likelihood of several threats to reliability and validity than traditional lab or website studies. Paolacci and colleagues (2010) assessed the following threats to be low: susceptibility to coverage error, risk of multiple responses by one person, risk of contaminated subject pool, and risk of dishonest responses, additionally the risk of experimenter effects was rated at “none.” Despite these benefits, the possibility for non-response bias is moderate and subject motivation is low (Paolacci et al., 2010). The quality of MTurk data has been supported: there are few differences in the attentiveness of MTurk workers compared to other participants, workers appear to be truthful when providing self-report data, and workers exhibit the same cognitive biases and logical fallacies as traditional participants (Paolacci & Chandler, 2014; Paolacci et al., 2010). Overall, MTurk is a “reliable source of experimental data in judgment and decision-making” (Paolacci et al., 2010, p. 416).

In order to be eligible for this study, participants had to have a HIT approval rate of greater than 95% for all Requesters’ HITs, a proxy measure for MTurk workers’ reputations (Peer et al., 2014), and must be located in the United States. Participants were required to be located in the United States because prescription opioid use is a health concern of national importance (Christie et al., 2017; Rudd et al., 2016a) given that

63.1% of 52,404 drug overdose deaths in the US in 2015 involved an opioid (Rudd et al., 2016b). Therefore, adults living in the US likely have unique beliefs about prescription opioid use relative to their counterparts living in other countries. The third requirement specified that if participants had participated in any part of the study, they would not be eligible to participate in any further part. This was achieved by assigning each participant the qualification of “past participant” and excluding anyone who had this qualification in subsequent parts of the study.

Participants who complete all items of the survey were compensated at the rate of \$1.00 for 10 minutes for the pilot study and study 2 and \$1.50 for 10 minutes for study 1. In order to enhance the reliability of the data, an item asking MTurk workers to affirm the accuracy of their responses was included as previous research has demonstrated this enhanced diligence among workers (Rouse, 2015). Taking into account the possibility that amendments to studies may be needed based on preliminary participant feedback, HITs were published in batches so that 20 workers were recruited at a time. At the end of all surveys, participants answered the accuracy affirmation question, were thanked for participating in the study, asked to provide their MTurk ID, and given a unique code to enter into the MTurk interface in order to ensure their compensation for completing the survey.

3.2 Methods

3.2.1 Participants

Participants were recruited from Mturk (see section 3.1). With the elimination of one participant who responded that their data should be deleted⁵ and another participant who reported that none of the relationships were relevant to them⁶, demographic data by relational identity selected to be most relevant and individual identity is listed in Table 2.

Table 2

Demographic Characteristics across Self-Selected Relational and Individual Identities

	Child	Parent	Significant Other	Individual
Sample Size	14	23	20	20
Age	30	35	32	33
Sex (Male)	79%	43%	65%	50%
Ethnicity	57%	83%	83%	70%
(White)	35,000	50,000	50,000	35,000
Income	Bachelor's/ Associates Degree	Some College but No Degree	Bachelor's Degree	Bachelor's Degree
Education				

Note. Data on age and income are median values. Data on highest level of education are mode values.

⁵ In order to enhance the reliability of the data, an item asking MTurk workers to affirm the accuracy of their responses was included as previous research has demonstrated this enhanced diligence among workers (Rouse, 2015). One participant responded that their data should be deleted, and their responses were subsequently deleted and not included in analysis.

⁶ A participant responding to the first published batch of the pilot study contacted the researcher via email to report that none of the relationships listed were relevant to them. In recognizing that this may be a possibility for other participants, an amendment was submitted to the IRB and the survey was subsequently amended to include the options “relational partner of a friend” and “none of these relationships are relevant me.”

3.2.2 Measures

Experience with prescription opioid use. Participants were asked whether they were prescribed an opioid in the past 30 days and given a list of the generic versions and brand names of the most commonly prescribed opioids and examples of over-the-counter pain relievers that are not considered prescription opioids (see Appendix C). Participants were then asked whether they had used a prescription opioid in the past 30 days, regardless of whether it was prescribed to them.

Experience of pain and risk for problematic prescription opioid use. Five items were adapted from the Prescription Drug Use Questionnaire- Patient Version (PUDQp; Compton et al., 2008) to assess participants' experiences with pain and their risk for problematic prescription opioid use using yes or no responses (see Appendix C). The items focused on (a) whether participants have one or more painful conditions; (b) are unable to work or participate fully in activities because of pain; (c) whether those in their immediate family have ever had a problem with chronic pain; (d) whether those in their immediate family have ever had a problem with drugs or alcohol; and (e) whether the participant had ever been or thought they might currently be addicted to prescription pain medications. The full PUDQp consists of 31 questions (Compton et al., 2008). However, because items from this measure were solely used as covariates to understand variations in the sample of participants, a shortened measure of five questions was used with each affirmative response indicating a greater likelihood for problematic prescription opioid use.

Relational identity relevance. Participants were asked to "select which of the following relationships is most meaningful to you" and given the response options of

child of a parent, relational partner of a significant other, parent of a child, relational partner of a friend, or none of these relationships are relevant to me. These relationships, while not randomly assigned, were used to manipulate self-categorization to the level of relational partner and thus acted as a quasi-experimental factor.

Thought listing. In order to make the relational and individual identities more salient, participants were first asked to think of their life from the perspective of the relational identity they selected (or the individual identity they were assigned), imagine experiencing long-term pain, and then list their thoughts. The thought listing directions varied depending on the relational identity that participants selected, but for example, participants who selected parent of a child as the most relevant relationship to them received the following instructions: “Think of yourself as a parent to your child. As a parent, you are experiencing long-term pain. Think of your life together, what is it like? Please list your thoughts.” Participants were then asked to list the thoughts that come to their mind when thinking about starting to use prescription opioids as a child/parent/friend/relational partner of a significant other/unique individual. The responses from this second thought listing procedure constituted the data analyzed for the pilot study.

Identity salience. Five items were adapted from previous research (Ma & Atwell-Seate, 2017; Palomares, 2009) to assess participants’ identity salience on a 7-point scale (1 = *Strongly Disagree*, 4 = *Neither Agree nor Disagree*, 7 = *Strongly Agree*). All items were phrased so that participants would focus on their mental state while listing their thoughts from an identity standpoint (e.g., “While listing my thoughts, I was thinking about being a child/parent/friend/relational partner of a significant other/unique

individual”). The items focused on the extent to which participants (a) thought about being a specific relational partner; (b) thought their relationship was central to their identity; (c) were unaware of their relational identity (reverse coded); (d) thought their relational identity was important; and (e) thought their relational identity came into play. When averaged in each condition, the five items formed a reliable measure of relational identity salience (child of a parent $M = 6.06$, $SD = .82$, $\alpha = .839$; parent of a child $M = 6.50$, $SD = .55$, $\alpha = .643^7$; significant other $M = 6.25$, $SD = .79$, $\alpha = .908$)

Demographic measures. Participants were asked to provide their age in years, sex, highest level of education, race, and household income (see Appendix D).

3.2.3 Procedure

After responding to the HIT and affirming consent (see Appendix B), participants first completed questions regarding their own and their family’s past experiences with prescription opioid use, pain, and substance use disorder. They were then asked which of the following relationships was most meaningful to them: child of a parent, relational partner of a significant other, or parent of a child. As described previously, there were two belief elicitation portions (see Section 3.2.2). Participants completed batteries of questions measuring the salience of the self-categorization during the belief elicitation procedure and demographic information. See Appendix E for complete pilot survey.

After collecting 3 batches resulting in 60 completed surveys, the results showed a consistent pattern regarding which relational identities (i.e., parent and significant other) were most relevant in the context of initiating prescription opioid use.

⁷ The reliability coefficient of the identity salience scale for participants who identify as parent of a child is lower than is typically acceptable (Tavakol & Dennick, 2011).

3.2.4 Thematic Analysis

The research question asked what themes characterize participants' feasibility and desirability beliefs about initiating prescription opioid use. I first holistically read all thought-listing responses and applied codes to the data (Pitts, 2013). Codes are defined as "summative, salient, essence-capturing, and/or evocative attribute to a portion of language-based or visual data" (Saldaña, 2015, p. 262). Coding was both deductive in that I applied first-cycle codes based on Lutchyn and Yzer's (2011) protocol and understandings of feasibility and desirability beliefs from TPB, and inductive in that I created second-cycle codes based on similarities that emerged across participants' belief statements (Tracy, 2013).

Once the first round of coding was complete, I began to collapse the data through second-cycle coding. In second-cycle coding, similar codes are clustered together under meaningful categories (Saldaña, 2015). For example, participants stated, "I think about all the money that would go into opioids" and "The financial costs of the drugs alone would send us to the street." These first-round codes were clustered together under the second-round code "Financial costs of opioids." The second-cycle codes were then categorized under the overarching themes of feasibility, desirability, or "other."

Responses were coded as desirability beliefs if they clearly referred to an outcome of the behavior (e.g., initiating prescription opioid use decreases pain), a referent important for the behavior (e.g., child, parent, doctor), or a reason for (not) performing the behavior (e.g., I want to live pain free; my friends look down on prescription opioid users; worry about becoming addicted). Responses were coded as feasibility beliefs if they clearly referred to barriers (e.g., prescription opioids are too expensive; prescription

opioids make me very tired) or facilitators (e.g., my insurance covers prescription opioids). Responses that did not represent either feasibility or desirability beliefs were coded as “other.”

Finally, feasibility beliefs were further categorized into barriers or facilitators in order to determine whether participants perceived a general ability to be able to initiate prescription opioid use (as represented by a greater proportion of facilitators) or felt that initiating prescription opioid use may be challenged by barriers. For example, the second-round code “Financial costs of opioids” was first categorized as a feasibility belief and then further categorized as a barrier. Desirability beliefs were also further categorized into normative or attitudinal concerns. I chose to subcategorize desirability beliefs in this way because considering a behavior from the perspective of a relational identity may make normative beliefs more salient (Stanley et al., 2017) and I wanted to see if this was the case. To facilitate analyses, I created a coding matrix with the overarching theme listed on the far left, subcategories of each of the three overarching themes listed in the middle column, and examples of each subcategory in the right-hand column, as recommended by Miles et al. (2019) (see Tables 4-6).

Then, the author and her advisor met and discussed the emergent themes, specifically noting where such themes might fit in or differ from feasibility and desirability concerns as characterized in Lutchyn and Yzer (2011). Finally, using an iterative approach, I cycled between the original data, the code matrix, and the theoretical frameworks of construal level theory and theory of planned behavior to allow TPB to guide analysis (Tracy, 2013). Throughout the coding process, TPB was referred to as a sensitizing framework (i.e., “theories or interpretive devices that start as jumping-off

points or lenses for qualitative study” Tracy, 2013, p. 28) and I discussed any discrepancies between the data, codes, and theory with my advisor until we reached agreement that the codes and theoretical analysis adequately represented the data.

3.2.5 Quantitative Coding Protocol

After qualitatively coding responses to the open-ended belief elicitation task, the beliefs were quantitatively coded in order to assess whether there were differences in the proportion of feasibility/desirability beliefs and pro/con beliefs across relational identities in order to assess hypotheses 1-2.

Following Lutchyn and Yzer’s (2011) protocol, within each participant’s answer, a belief was coded as distinct when it referred to a single outcome, impeding or facilitating factor, and one particular person or reference group. Abstract general thoughts and concrete specific thoughts, even if related, were coded as distinct because they represent different construal levels. For example, the statement “I have seen and heard about the addictions and how they cripple people even more so I will not even try them” was coded as two distinct desirability beliefs: one belief referring to addiction as a more abstract thought, one belief referring to “how they cripple people” as a more concrete thought.

3.3 Results

3.3.1 Thematic Findings

Table 3 details the percentage of participants in each relational identity category who affirmed experiences with prescription opioid use, the experience of pain, and substance use disorder, in addition to participants in the concurrent individual identity condition.

Table 3

Experience of Pain, Opioid Use, and Substance Use Disorder across Relational and Individual Identities

	Child	Parent	Significant Other	Individual
Prescribed Opioid in 30 Days (Yes)	29%	30%	15%	40%
Used Opioid in 30 Days (Yes)	29%	22%	15%	35%
Painful Condition (Yes)	57%	70%	45%	50%
Disabling Pain (Yes)	29%	26%	5%	25%
Family Chronic Pain (Yes)	86%	65%	55%	65%
Family Substance Use (Yes)	71%	48%	45%	30%
Addiction to Pain Medication (Yes)	21%	9%	10%	35%

Examining research question 1 resulted in seven distinct subcategories of attitudinal beliefs regarding initiating prescription opioid use, seven subcategories of normative beliefs, four subcategories of beliefs about barriers to initiating opioid use, and five subcategories of facilitators. The findings are represented in Tables 4-6.

Table 4

Attitudinal Beliefs Regarding the Desirability of Initiating Prescription Opioid Use

Sub-Belief Type	Category	Example	Mentions
Attitudinal			

Concern about Fentanyl	“I have to worry about Fentanyl-laced pills”	1
Concern about people stealing opioids	“have people who are break in and steal them.”	1
Opioids help body	“I would hope that it would increase functionality of my life.”	5
Opioids help mind	“I am feeling better and confident”	4
Pain	“If getting rid of my pain, I have to use prescription opioids, then I will take them.”	15
Addiction concerns	“I would be very worried about addiction.”	48
Concern about side effects	“I could have side effects that would leave me worse off than when I was just suffering from pain.”	27

Table 5*Normative Beliefs Regarding the Desirability of Initiating Prescription Opioid Use*

Sub-Belief Type	Category	Example	Mentions
Normative	Addiction may harm relationships	“I would worry about becoming addicted, and how it would affect our relationship.”	3
	Stigma attached to opioid use	“...using opioids would definitely make me less of a person in the eyes of others.”	5
	Trust relational partner to decide	“I trust my parents and doctor in making a decision that is best for me and my health.”	5

Burden to partner	“If I use them, I would put an even greater strain on my partner, as it would even further reduce my ability to function, which is already low.”	5
Harmful to child and parenting abilities	“I would question my ability to take care of my child while on them.”	11
Concern opioids will negatively affect partner or family	“I have to maintain responsibility in my life, which means if prescription opioids affected my personality or career ability, then I would likely start having issues in my romantic life as well.”	5
Willingness to use opioids to improve relationships	“I need to feel better so I can keep them around.”	8

Table 6*Feasibility Beliefs Regarding Initiating Prescription Opioid Use*

Sub-Belief Type	Category	Example	Mentions	
Feasibility	Barrier	Decrease in prescribed amount of opioids	“My doctor recently had to cut back on my regular amount, even though I've never done anything wrong.”	1
		Financial cost of opioids	“The financial costs of the drugs alone would send us to the street.”	8
		Fear of using opioids	“I am scared to death using these drugs.”	12

	Desire for opioid alternatives	“I'd hope I would have some sort of rehab for whatever injury to not rely on drugs mainly.”	5
Facilitator	Short length of use	“I would want to only use them for a short amount of time.”	4
	Nighttime use to be alert	“I would try to only take the prescription or medication at night so I would be more alert during the day.”	1
	Lock opioids to prevent diversion	“I would make sure the drugs were safely locked away so my child could not get to them.”	2
	Safeguards to avoid addiction	“I would be very cautious about communicating with my doctor to make sure that I don't end up addicted.”	5
	Can't handle pain without opioids	“I know I'm not strong enough to take the pain without it”	3

3.3.2 Quantitative Belief Generation Results

To examine whether the quasi-experimental factor (i.e., self-categorization) affected generation of desirability beliefs relative to feasibility beliefs, I analyzed responses to the question that asked participants' beliefs about initiating prescription opioid use. The number of feasibility, desirability, normative, attitudinal, and other

beliefs each participant generated were entered into SPSS and ANOVAs were conducted on this data. All one-way ANOVAs were run with self-categorization as the between-subjects factor with four levels (i.e., child, parent, significant other, individual). When ANOVAs were statistically significant, I computed and report Tukey's Honestly Significant Difference (HSD) test with 95% confidence intervals of the estimated mean difference between groups. When the assumption of homogeneity of variance was not met, as indicated by a statistically significant Levene's test of homogeneity of variances, I used Welch's ANOVA with Games-Howell post hoc comparisons.

Self-categorization effects on feasibility and desirability belief generation.

Following procedures from Liberman and Trope (1988) and Lutchyn and Yzer (2011), feasibility beliefs were scored -1, desirability beliefs were scored +1, and other beliefs were scored 0 and then summed to get each participant's score. Thus, a negative score for a participant indicates a predominance of feasibility beliefs, whereas a positive score indicates a predominance of desirability beliefs, and a score closer to 0 indicates a balance between feasibility and desirability beliefs. There was no significant difference between feasibility/desirability belief dominance across relational and individual identities, $F(3, 73) = 1.018$, $\eta^2 = .04$, $p = .390$. See Table 7 for feasibility/desirability belief dominance means and standard deviations across relational and individual identities.

Table 7

Means and Standard Deviations of Feasibility/Desirability Belief Dominance across Relational and Individual Identities

Identity	<i>n</i>	<i>M</i>	<i>SD</i>
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Child	14	1.86	1.70
Parent	23	1.48	1.62
Significant Other	20	2.20	1.61
Individual	20	1.40	1.67

See Table 8 for the proportions of each belief type compared to total beliefs across relational and individual identities.

Table 8

Proportion of Feasibility and Desirability Beliefs Relative to Total Number of Beliefs across Relational and Individual Identities

	Child (%)	Parent (%)	Significant Other (%)	Individual (%)
Desirability	72.55	72.88	75	60.32
Normative	19.61	30.51	18.75	2.63
Attitudinal	52.91	42.37	56.25	97.3
Feasibility	21.57	15.25	20.00	19.05
Other	5.88	11.86	5.00	20.63

Note. The denominators used to calculate the percentage of normative and attitudinal beliefs was the total number of desirability beliefs in the condition. For all other categories, the denominator used to calculate the percentages were the total number of desirability, feasibility, and other beliefs in the condition.

In terms of differences in specific belief types, there was no significant difference in the average number of feasibility beliefs across relational and individual identities, F

(3, 73) = 1.37, $\eta^2 = .05$, $p = .259$. There was no significant difference in the average number of other beliefs across relational and individual identities, Welch's $F(3, 39.73) = 1.05$, $\omega^2 = .014$, $p = .381$.

There was a significant difference in the average number of desirability beliefs across relational and individual identities, $F(3, 73) = 3.47$, $\eta^2 = .12$, $p = .02$. Post hoc comparisons using the HSD test indicated that the mean desirability belief score for the individual condition ($M = 1.85$, $SD = 1.39$) was significantly lower than mean desirability belief score for the significant other condition ($M = 3.00$, $SD = 1.38$), 95% CI = 0.01, 2.29. The mean desirability belief score for the significant other condition was significantly higher than the mean desirability belief score for the parent condition ($M = 1.87$, $SD = 1.36$), 95% CI = 0.02, 2.24. However, the child condition ($M = 2.64$, $SD = 1.39$) did not differ significantly from the significant other condition (95% CI = -1.62, 0.90), parent condition (95% CI = -0.45, 2.00), or individual condition (95% CI = -0.47, 2.05) in mean desirability belief score.

There was a significant difference in the average number of normative beliefs across relational and individual identities, Welch's $F(3, 31.07) = 8.81$, *est.* $\omega^2 = .23$, $p < .001$. Post hoc comparisons using Games-Howell tests indicated that the mean normative belief score for the individual condition ($M = .05$, $SD = .22$) was significantly lower than the significant other condition ($M = .75$, $SD = 1.02$), 95% CI = -1.35, -0.05, and the parent condition ($M = .78$, $SD = .90$), 95% CI = -1.27, -.20. However, the child condition ($M = .71$, $SD = .91$) did not differ significantly from the significant other condition (95% CI = -0.94, 0.87), parent condition (95% CI = -0.91, 0.77), or individual condition (95% CI = -0.06, 1.39) in mean normative belief score.

There was a significant difference in the average number of attitudinal beliefs across relational and individual identities, $F(3, 73) = 3.077$, $\eta^2 = .11$, $p = .033$. Post hoc comparisons using the HSD test indicated that the mean attitudinal belief score for the parent condition ($M = 1.09$, $SD = .95$) was significantly lower than the significant other condition ($M = 2.20$, $SD = 1.44$), 95% CI = 0.10, 2.12. However, the child condition ($M = 1.93$, $SD = 1.33$) did not differ significantly from the significant other condition (95% CI = -1.42, 0.88), parent condition (95% CI = -0.28, 1.96), or individual condition (95% CI = -1.02, 1.28) in mean attitudinal belief score. The individual condition ($M = 1.80$, $SD = 1.32$) did not differ significantly from the significant other condition (95% CI = -1.44, 0.64), parent condition (95% CI = -0.30, 1.72), or child condition (95% CI = -1.28, 1.02) in mean attitudinal belief score. See Table 9 for the ANOVAs across relational and individual identities with belief type as outcome variable. See Table 10 for post hoc analyses for significantly significant ANOVAs across relational identities.

Table 9

One-way Analysis of Variance in Belief Type across Relational and Individual Identities

	Child	Parent	Significant Other	Individual	$F(3,$ 73)	p
	$M (SD)$	$M (SD)$	$M (SD)$	$M (SD)$		
1. Feasibility/ Desirability Dominance	1.86 (1.70)	1.48 (1.62)	2.20 (1.61)	1.40 (1.67)	1.02	.390
2. Desirability Beliefs	2.64 (1.39) _{ab}	1.87 (1.36) _a	3.00 (1.38) _b	1.85 (1.39) _a	3.47	.020
3. Attitudinal	1.93 (1.33) _{ab}	1.09 (0.95) _a	2.20 (1.44) _b	1.80 (1.32) _{ab}	3.08	.033
4. Normative	0.71 (0.91) _{ab}	0.78 (0.90) _a	0.75 (1.02) _a	0.05 (0.22) _b	3.63	.017

5. Feasibility Beliefs	0.79 (0.89)	0.39 (0.58)	0.80 (0.70)	0.69 (0.82)	1.37	.250
6. Pro/Con Dominance	-1.43 (1.70)	-1.00 (1.71)	-1.90 (2.36)	-0.60 (2.06)	1.57	.203
7. Pros	1.00 (1.24)	0.65 (0.98)	0.95 (1.23)	0.60 (0.82)	1.37	.259
8. Cons	2.43 (1.09) _{ab}	1.65 (1.19) _a	2.85 (1.53) _b	1.55 (1.43) _a	4.37	.007

Note. _{a-b} Means in a row without a common subscript differ significantly ($p < .05$), as

analyzed by a post hoc analyses of one-way ANOVAs. For analyses 1 and 6, negative scores indicate a predominance of feasibility or con beliefs and positive scores indicate a predominance of desirability or pro beliefs. For all other analyses, scores represent count data where 0 indicates the absence of a belief type.

Table 10

Post hoc Analyses of Belief Types Differing Significantly across Relational and

Individual Identities

	(I) Group	(J) Group	Mean Difference (I-J)	SE	<i>p</i>	95% CI	
						LL	UL
Desirability	SO	P	1.13	.42	.025	0.12	2.14*
		C	0.36	.48	.737	-0.80	1.51
		I	1.15	.43	.049	0.00	2.29*
	P	C	-0.77	.46	.229	-1.89	0.35
		I	0.02	.42	1.00	-1.09	1.13
		C	0.79	.48	.356	-0.47	2.05
Attitudinal	SO	P	1.11	.38	.013	0.20	2.02*
		C	0.27	.43	.803	-1.31	0.76
		I	0.40	.40	.746	-0.64	1.44
	P	C	-0.84	.42	.118	-1.85	0.16
		I	-0.71	.38	.256	-1.72	0.30
		C	0.13	.44	.991	-1.02	1.28
Normative ^a	SO	P	-0.03	.30	1.00	-0.83	0.76
		C	0.04	.33	1.00	-0.87	0.94
		I	0.70	.23	.032	0.05	1.35*
	P	C	0.07	.31	.996	-0.77	0.91
		I	0.73	.19	.005	0.20	1.26*
		C	0.66	.25	.077	-0.059	1.38
Cons	SO	P	1.20	.40	.011	0.24	2.15*
		C	0.42	.45	.623	-0.67	1.51

	I	1.30	.42	.015	0.19	2.41*
P	C	-0.78	.44	.192	-1.84	0.28
	I	0.10	.41	.994	-0.97	1.17
C	I	0.88	.46	.242	-0.34	2.10

Note. SO = significant other; P = parent; C = child; I = individual; LL = lower limit; UL = upper limit.

^a Normative belief did not meet the assumption of homogeneity of variance and so Welch's ANOVA was used with Games-Howell post hoc tests.

* $p < .05$.

Self-categorization effects on generation of pros and cons. To examine whether taking on different relational identities influenced generation of pros and cons, I coded all feasibility and desirability beliefs as either positive or negative. I then created an index by assigning each positive belief 1 and each negative belief -1 and then summed to get each participant's score, in line with Lutchyn and Yzer (2011). Thus, a negative score for a participant indicates a predominance of con beliefs, whereas a positive score indicates a predominance of pro beliefs, and a score closer to 0 indicates a balance between pro and con beliefs. See Table 11 for means and standard deviations of the pro/con dominance score across relational and individual identities. See Table 12 for the proportions of pro and con beliefs compared to total beliefs across relational and individual identities.

There was no significant difference between pro/con dominance score based on self-categorization, $F(3, 73) = 1.57, \eta^2 = .06, p = .203$. However, the effect size is worth noting and suggests that with more participants, differences in the pro/con dominance score across relational and individual identities may have reached significance. I conducted a post hoc power analysis for ANOVA using G*Power 3.1 (Faul et al., 2009).

The input parameters were effect size $f = .25$; α error probability = .20; total sample size = 77; number of groups = 4. Based on these parameters, the test achieved power .67.

Table 11

Means and Standard Deviations on Pro/Con Belief Dominance across Relational and Individual Identities

Identity	<i>n</i>	<i>M</i>	<i>SD</i>
Child	14	-1.9	2.36
Parent	23	-1.0	1.71
Significant Other	20	-1.43	1.70
Individual	20	-.60	2.06

There was no significant difference in the average number of pro beliefs across relational and individual identities, $F(3, 73) = 0.389$, $\eta^2 = .02$, $p = .761$. There was a significant difference in the average number of con beliefs across relational and individual identities, $F(3, 73) = 4.37$, $\eta^2 = .15$, $p = .007$. Post hoc comparisons indicated that the mean con belief score for the individual condition ($M = 1.55$, $SD = 1.43$) was significantly lower than the mean con belief score for the significant other condition ($M = 2.85$, $SD = 1.53$), 95% CI = 0.19, 2.14. The mean con belief score for the significant other condition was significantly higher than the mean con belief score for the parent condition ($M = 1.65$, $SD = 1.19$), 95% CI = 0.12, 2.27. However, the child condition ($M = 2.43$, $SD = 1.08$) did not differ significantly from the significant other

(95% CI = -1.64, 0.80), parent (95% CI = -0.41, 1.97), or individual (95% CI = -0.34, 2.10) conditions in terms of the average number of con beliefs.

Table 12

Proportion of Pro and Con Beliefs Relative to Feasibility and Desirability Beliefs across Relational and Individual Identities

	Child (%)	Parent (%)	Significant Other (%)	Individual (%)
Pros	29.16	27.45	25	38
Cons	70.83	72.55	75	62

3.4 Summary

The belief elicitation portion of pilot study 1 revealed themes in terms of feasibility, desirability, attitudinal, and normative beliefs that U.S. adults hold regarding prescription opioid use. Evidence further pointed to self-categorization as influencing belief type generation in the context of prescription opioid use, though there were unexpected patterns in belief type generation across relational and individual self-categorizations. There was no difference in feasibility/desirability dominance or pro/con dominance across relational and individual identities. However, these belief dominance measures would likely have been significantly different across relational and individual identities with a larger sample. Still, this contradicts what would be predicted by CLT if we consider self-categorization to be a psychological distance cue. If self-categorization acts as a psychological distance cue, we would expect participants who self-categorize at the individual level to evince feasibility (low construal level) belief dominance and those who self-categorize at the relational level to evince desirability (high construal level)

belief dominance. Analysis of variance tests for each belief type present a picture more in line with construal level theorizing in that participants who self-categorized as significant others had significantly more desirability and normative beliefs than individuals. This suggests that self-categorizing at a more inclusive level (i.e., relational as opposed to individual) results in the generation of more high construal level beliefs (i.e., desirability and normative beliefs). Self-categorizing as a parent somewhat echoed this pattern in that parents evinced more normative beliefs than individuals. Unlike what would be expected on the basis of construal level theory, participants who self-categorized as significant others evinced more con beliefs than individuals. Con beliefs are considered low-level construals whereas pro beliefs are considered high-level construals. Thus, we would expect that as level of self-categorization increases, the number of pro beliefs elicited would increase.

In summary, participants who self-categorized as significant others evinced higher mean numbers of con, desirability, and attitudinal beliefs than parents. Furthermore, participants who self-categorized as significant others evinced higher mean numbers of desirability and normative beliefs than those who self-categorized as individuals. This partially supports hypothesis 1 by demonstrating that self-categorization influences construal level such that those who self-categorize at more inclusive levels produce more high-level construal beliefs. Specifically, that self-categorizing at increasingly inclusive levels (i.e., moving from subordinate to relational categorizations) is positively associated with desirability beliefs. However, hypothesis 1 is not fully supported because self-categorization at more inclusive levels was not negatively associated with feasibility beliefs. Specifically, there was no significant difference in the number of feasibility

beliefs depending upon self-categorization. Hypothesis 2 was not supported in the pilot study: significant others evinced significantly more con beliefs than individuals, the opposite of what would be expected based on CLT and self-categorization. Furthermore, self-categorization at increasingly inclusive levels (i.e., moving from subordinate categorizations to relational) was not significantly associated with pro focus. In light of these findings, and acknowledging that participants self-selected into relational categorizations, I moved into study 1 with significant other as the relational identity that participants were randomly assigned to along with individual, American, and human being.

Chapter 4: Study 1

The pilot study indicated that self-categorizing at the relational identity of significant other resulted in a greater number of high-construal beliefs (i.e., desirability beliefs, normative beliefs) than self-categorizing as an individual. This aligns with theorizing that self-categorizing at increasingly inclusive levels results in a predominance of higher construal level beliefs. Having established that this pattern most reliably occurs among those who self-categorize as significant others, this relational identity was used to manipulate self-categorization along with individual (subordinate), intermediate, and superordinate identities in study 1. Study 1 was undertaken to answer hypotheses 1-3, concerning whether self-categorization acts as a message cue to influence perceived psychological distance and construal level. Participants' self-categorization was manipulated in the questions asked and participants engaged in an open-ended belief elicitation procedure.

4.1 Methods

Study 1 also collected participants' beliefs about prescription opioid use to further refine the answer to the research question and assess hypotheses 1-3 concerning self-categorization as a message cue that influences construal level and psychological distance.

4.1.1 Participants

Participants were recruited from MTurk (see section 3.1) using the same HIT used to recruit participants for the pilot study (see Appendix A). In order to determine the number of participants, I conducted a priori power analyses for ANOVA and linear multiple regression using G*Power 3.1 (Faul et al., 2009). Generally, power of .8 is

considered a reasonable compromise between the possibility of attaining significant results and the costs associated with increasing power (Cohen, 2013). The input parameters for each statistical test are listed in Table 13 along with the total sample size estimated. Based on these power analyses, the total sample size needed for study 1 is 248.

Table 13

Power Analyses for Study 1 ANOVA and Mediation Models

Statistical Test	Parameters	Total Sample Size
ANOVA: Fixed effects, omnibus, one-way	effect size $f = .16$; α error probability = .20; power = .80; number of groups = 4	248
Linear multiple regression: Fixed model, R^2 deviation from zero	Effect size $f^2 = .0256$; α error probability = .20; power = .80; number of predictors = 2	224

Note. Effect size f was calculated based on the means and standard deviations of the feasibility/desirability belief dominance as shown in Table 9. Effect size f^2 was derived from effect size f .

Data were collected November 8th through November 22nd, 2019. With the elimination of two participants who responded that their data should be deleted, 41 responses deemed likely to have been completed by bots⁸, six participants who completed

⁸ Bots are automated programs that mimic human behavior. In the summer of 2018, a “bot panic” occurred when psychologists noticed and began discussing a quality drop in MTurk data (Dreyfuss, 2018). Indeed, a study found that compared to data collected in 2017, data collected from summer 2018–spring 2019 are less

the study more than once⁹, four participants who did not complete both thought listing exercises, and 14 participants whose thought listing responses did not make sense and/or did not relate to opioid use, a total of 259 participants' data was kept. Demographic data by identity condition assignment is listed in Table 14.

Table 14

Demographic Characteristics across Identity Conditions

	Individual	Significant Other	American	Human Being
Sample Size	66	58 ¹⁰	70	62
Age	32.50	36	35	34.5
Sex (Male)	59.1%	65.6%	65.7%	46.8%
Ethnicity (White)	86.4%	78.7%	88.6%	83.9%
Income	50,000-59,999	50,000-59,999	40,000-49,999	40,000-49,999
Education	Bachelor's Degree	Bachelor's Degree	Bachelor's Degree	Bachelor's Degree

Note. Data on age and income are median values. Data on highest level of education are mode values.

Participants also provided information about their own and their family members' experiences with prescription opioid use, the experience of pain, and substance use

reliable, though they noted data screening can help ameliorate reliability issues (Chmielewski & Kucker, 2020). Two indicators of bots completing surveys include repeated GPS locations and answers to open-ended questions that do not make sense or include phrases that appear verbatim online when searched via Google (Chmielewski & Kucker, 2020). In study 2, I included Captcha to ensure data from bots is not included in my study.

⁹ When participants completed the study more than once, their first response was kept but subsequent responses were deleted from the dataset.

¹⁰ Three participants in the significant other condition completed thought listing but did not complete the entire survey, resulting in missing demographic information.

disorders. Across all conditions, 7.3% ($n = 19$) of participants had been prescribed an opioid in the past 30 days and 6.6% ($n = 17$) participants had used a prescription opioid in the past 30 days regardless of whether it had been prescribed to them or not. Many participants (i.e., 94; 36.3%) said that they have one or more painful conditions but fewer (i.e., 48; 18.5%) answered that they are unable to work or participate fully in activities because of pain. Regarding family members' experiences, ($n = 132$; 51%) participants answered yes, that someone in their immediate family had a problem with chronic pain. Many participants ($n = 111$; 42.9%) answered yes, that someone in their immediate family had ever had a problem with drugs or alcohol. Twenty-one participants (8.1%) answered yes, that they have ever been or think they might currently be addicted to prescription pain medications. Table 15 details the percentage of participants in each identity condition who affirmed experiences with each question.

Table 15

Experience of Pain, Opioid Use, and Substance Use Disorder across Identity Conditions

	Individual	Significant Other	American	Human Being
Prescribed Opioid in 30 Days (Yes)	9.1%	4.9%	11.4%	3.2%
Used Opioid in 30 Days (Yes)	9.1%	8.2%	4.3%	4.8%
Painful Condition (Yes)	33.3%	37.9%	35.7%	40.3%
Disabling Pain (Yes)	16.7%	10.3%	24.3%	22.6%
Family Chronic Pain (Yes)	53%	44.8%	51.4%	56.5%

Family Substance Use (Yes)	50%	34.4%	42.9%	43.5%
Addiction to Pain Medication (Yes)	12.1%	6.6%	10%	3.2%

Participants were also asked about their U.S. citizenship status. The majority of participants were U.S. citizens ($n = 255$; 98.5%) though a few were U.S. permanent residents ($n = 6$; 2.3%). Finally, participants selected which relationship was most relevant to them: parent ($n = 83$; 32%), significant other (e.g., boyfriend, wife, partner) ($n = 109$; 42.1%), friend ($n = 34$; 13.1%), child of a parent ($n = 20$; 7.7%), none of these relationships is relevant to me ($n = 10$; 3.9%). Among participants in the significant other condition, the most relevant relationships were significant other ($n = 32$; 52.5%), parent ($n = 13$; 21.3%), friend ($n = 8$; 13.1), and child of a parent ($n = 3$; 4.9%). Two participants (3.3%) said “none of the relationships is relevant to me.”

4.1.2 Measures

Most measures for study 1 were used in the pilot study, including measures designed to assess experience with prescription opioid use, experience of pain and risk for problematic prescription opioid use, identity salience, thought listing procedures, and demographics. See section 3.2.2 for a description of these measures. Measures that were unique to study 1 included belief items based on pilot study 1 responses, likelihood of using prescription opioids, and psychological distance. These measures are described in greater detail in the following paragraphs.

Feasibility beliefs. Based on participants’ responses to the pilot study, 9 items were created to assess the extent to which participants believed that certain elements might impede or facilitate their use of prescription opioids. All beliefs were assessed on a

7-point scale (1 = *Not at all*, 7 = *A great deal*). All items were phrased so that participants would focus on their mental state while completing the measure from an identity standpoint (e.g., as an American, to what extent would...).

The feasibility items designed to get at barriers asked, “does a) the financial costs of prescription opioids, b) fear or nervousness about using opioids, c) alternative pain relief methods, and d) your healthcare provider’s willingness to prescribe opioids... influence your ability to use prescription opioids?” The item concerning healthcare provider’s willingness to prescribe opioids was meant to tap the belief voiced by one participant that their doctor decreased their prescribed amount of opioids. For participants, many of whom are not currently prescribed opioids, asking specifically whether their healthcare provider cut back on their prescribed opioids does not make sense, therefore I asked more generally about healthcare providers’ willingness to prescribe opioids.

The feasibility items designed to get at facilitators asked, “to what extent would a) the possibility of only using opioids for a short time, b) the ability to prevent others (e.g., children, family members) from accessing your prescription opioids, c) the possibility of safeguards to avoid opioid addiction, d) inability to handle pain without prescription opioids, and e) the possibility of altering prescription opioid use to avoid side effects... influence your ability use prescription opioids?” The facilitating feasibility belief about using prescription opioids at night to be alert, which was voiced by one participant, was subsumed under the question regarding altering prescription opioid use to avoid side effects. Locking opioids to prevent diversion was voiced by two participants in the pilot

study and was abstracted into the question regarding preventing others from accessing prescription opioids.

Desirability beliefs. Based on participants' responses to the pilot study, 10 items were created to assess the extent to which specific desirability beliefs would influence their decision to initiate prescription opioids. All beliefs were assessed on a 7-point scale (1 = *Not at all*, 7 = *A great deal*). All items were phrased so that participants would focus on their mental state while completing the measure from an identity standpoint (e.g., as an American, to what extent would...).

The normative desirability items asked, “does a) stigma of opioid use, b) the possibility that opioid use may improve your relationships, c) the possibility that opioid use may hurt your relationships, d) concern that addiction may harm your relationships, and e) trust in your healthcare provider... influence whether you would use prescription opioids?” Though they were identified as distinct themes of normative beliefs, the possibility that opioid use may harm your ability to parent and may burden your partner were not included as questions because of the possibility that these relational identity specific concerns may muddy the identity manipulation by making an additional relational identity salient. Trust in other relational partners was also not included as a unique item because it was only voiced by participants in the child identity condition who imagined themselves in a minor position where their parents would make the decision about whether they should use prescription opioids.

The attitudinal desirability items asked, “does a) the possibility of improving physical functioning, b) the possibility of improving your mental health, c) the possibility of relieving pain, d) concern about addiction, and e) concern about side

effects...influence whether you would use prescription opioids?” Though they were identified as distinct themes of attitudinal beliefs, concern about fentanyl and concern about people stealing prescription opioids were not included in the attitudinal measures because each was only referred to by one participant.

Likelihood of using prescription opioids. Participants rated their probability of starting prescription opioid use on a 100-mm graphical rating scale with the anchors *extremely low* and *extremely high*, a measure adapted from Eyal and colleagues (2000). The question was phrased so that participants would focus on their mental state while completing the measure from an identity standpoint (e.g., as an American, how likely is it that you would start to use prescription opioids?).

Psychological distance. Participants completed four questions based on previous theorizing about the dimensions of psychological distance and an additional question using the inclusion of other in self scale to assess the extent to which self-categorization influenced their psychological distance. Participants were asked “to what extent did thought listing make you a) think about using prescription opioids in the near future (e.g., this evening, tomorrow), b) imagine using prescription opioids in a physically near location (e.g., your home), c) make the possibility of using prescription opioids seem real, and d) make you focus your thoughts on yourself?” Responses were assessed on a 7-point scale (1 = *Not at all*, 7 = *A great deal*).

Participants were then asked to “click the picture below which best describes your relationship to the issue of prescription opioid use (represented by X)” and presented with a modified version of the Inclusion of the Other in the Self (IOS) scale. The modified

IOS scale from Gächter et al. (2015) depicts seven pairs of circles one labeled “self” the other labeled “X” that range in the extent to which they overlap.

4.1.3 Procedure

After responding to the HIT and affirming consent (see Appendix B), participants were randomly assigned to one of four self-categorization conditions: unique individual (subordinate), significant other (relational), American (intermediate), and human being (superordinate). As with the pilot study, participants completed two belief elicitation portions that varied depending on the self-categorization condition to which they were assigned (see Section 3.2.2). Participants then completed batteries of questions measuring the salience of the self-categorization during the belief elicitation procedure, the extent to which beliefs elicited from the pilot study would influence their decision to initiate opioid use, and psychological distance. Finally, participants provided demographic information and answered questions regarding their own and their immediate family’s past experiences with prescription opioid use, pain, and substance use disorder. See Appendix F for complete study 1 survey.

4.1.4 Coding Protocol

Responses to the unprompted thought-listing task were coded following the procedure laid out by Lutchyn and Yzer (2011), as done in pilot study 1. See section 3.2.5 for the coding protocol.

4.1.5 Data Analysis

Data analysis consisted of four procedures. I began by analyzing the open-ended thought listing responses following the procedures in pilot study 1 (Section 3.3.2 for details on analysis using ANOVA). Then, I analyzed the closed-ended belief questions. I

began with an exploratory factor analysis (EFA) to identify the latent constructs driving variation in beliefs. EFA is appropriate because despite theoretical conceptualization of feasibility and desirability beliefs, there has been no empirical evidence collected that speaks to the feasibility and desirability beliefs people hold about prescription opioid use specifically. Next, I assessed the measurement model where all latent factors are allowed to covary freely (Mueller & Hancock, 2019). This is part of a recommended two-step approach to latent variable path analysis because if the measurement model does not achieve adequate fit then the structural model will certainly not achieve adequate fit (Mueller & Hancock, 2019). Finally, I compared three structural models (see Section 2.4) to understand which model best fit the process, given the bidirectional relationships between construal level theory variables, and interpreted the best-fitting model.

Exploratory factor analysis. An EFA with maximum likelihood extraction was run in SPSS version 25 to model the relations among the belief items as stemming from latent variables, in other words, variables that are not measured but are believed to drive the relations among measured variables. Based on the conceptualization of feasibility and desirability beliefs, I conjectured that certain beliefs voiced in the pilot study were feasibility or desirability beliefs, but as Bandalos and Finney (2019) note, “items are rarely aware of the scale for which they have been written and often fail to behave as they should” and therefore even with theoretical conjecturing EFAs should be used unless there is previous empirical evidence (p. 101).

Measurement phase. As part of the two-step approach to latent variable path modeling (Mueller & Hancock, 2019), I first assessed the measurement model where all items are specified under the latent factors they indicate, and all latent factors are allowed

to covary. The measurement model was based on the findings of the EFA. A CFA with maximum likelihood extraction was run RStudio version 1.2.5003 using the Lavaan package (Rosseel, 2012) to model the relations among items as stemming from latent variables. A CFA was appropriate given that the structure of all latent variables has been studied using exploratory factor analysis (see section 4.2.3; Bandalos & Finney, 2019).

Structural phase. I dummy coded the manipulated variable, self-categorization condition (unique individual, significant other, American, human being). Both human being and individual conditions were run as the reference group in separate analyses and there were no differences in model fit. Individual was chosen as the reference group because message tailoring, which refers to communication customized to individual persons, has been advocated for health communication messages (Noar et al., 2009) and is more frequently used than messaging specifically appealing to relational identities or group identities. Retaining the final measurement model, the structural model including paths between the latent and manipulated variables were specified. There were no issues with convergence, estimates, or identification with the structural model (Mueller & Hancock, 2019). Endogenous latent variables were scaled using the default in the Lavaan package (Rosseel, 2012) by fixing a path to one of their indicator variables to 1.

4.2 Results

An initial informal analysis indicated that few participants referenced the self-categorization they were assigned to in responding to the thought listing question about initiating prescription opioid use. Three participants in individual condition (4%; 3/67), over half of the participants in the significant other condition (56%; 36/64), two participants in the American condition (2%; 2/70), and two participants in the human

being condition (3%; 2/62), referred to their self-categorization when listing their thoughts about initiating prescription opioid use. Despite generally few references to their assigned self-categorization, identity salience was high across all identity conditions with the mean identity salience scores for individual ($M = 5.53$, $SD = 1.03$), significant other ($M = 6.00$, $SD = 0.88$), American ($M = 5.20$, $SD = 1.41$), and human being ($M = 6.16$, $SD = 0.89$) all greater than 5 on a 7-point scale.

4.2.1 Self-Categorization Effects on Generation of Feasibility and Desirability Beliefs

To examine whether self-categorization affected generation of desirability and feasibility beliefs, I analyzed participants' belief elicitation responses regarding prescription opioid use (see Section 3.2.5). The proportion of each belief type compared to total beliefs across identities is listed in Table 16.

Table 16

Proportion of Feasibility and Desirability Beliefs Relative to Total Number of Beliefs across Self-Categorization

	Individual $M (SD)\%$	Significant Other $M (SD)\%$	American M $(SD)\%$	Human M $(SD)\%$
Desirability	3.65 (2.65)	3.57 (2.65)	2.8 (1.47)	3.74 (2.32)
	66.76%	67.08%	62.22%	70.09%
Normative	0.37 (0.67)	1.16 (1.28)	0.24 (0.49)	0.34 (0.62)
	7.05%	32.57%	8.67%	9.05%
Attitudinal	3.34 (2.57)	2.43 (2.20)	0.24 (0.49)	3.43 (2.27)
	54.36%	67.89%	90.82%	91.81%
Feasibility	1.71 (1.39)	1.67 (1.95)	1.46 (1.41)	1.49 (1.47)
	31.30%	31.38%	32.38%	27.49%

Note. The denominators used to calculate the percentage of normative and attitudinal beliefs was the total number of desirability beliefs in the condition. For all other categories, the denominator used to calculate the percentages were the total number of desirability, feasibility, and other beliefs in the condition.

I then conducted one-way ANOVAs with self-categorization as the between-subjects factor with four levels (i.e., individual, significant other, American, human being) (see Section 3.3.2). There was no significant difference in feasibility/desirability belief dominance across self-categorizations, Welch's $F(3, 136.58) = 2.09$, *est.* $\omega^2 = .005$, $p = .104$. See Table 17 for feasibility/desirability belief dominance means and standard deviations across self-categorizations.

Table 17

Means and Standard Deviations of Feasibility/Desirability Belief Dominance across Relational and Individual Identities

Identity	<i>n</i>	<i>M</i>	<i>SD</i>
Individual	66	1.94	2.91
Significant Other	61	1.90	3.46
American	70	1.30	2.05
Human Being	62	2.27	2.57

Note. A negative score indicates a predominance of feasibility beliefs, a positive score indicates a predominance of desirability beliefs, and a score closer to 0 indicates a balance between feasibility and desirability beliefs.

There was no significant difference in the average number of feasibility beliefs across self-categorizations, $F(3, 253) = 3.32, \eta^2 = .005, p = .717$.

There was a significant difference in desirability beliefs across self-categorizations, Welch's $F(3, 132.85) = 4.14, est. \omega^2 = .018, p = .008$. Post hoc comparisons using the Games-Howell post-hoc test indicated that the mean desirability belief score for the American condition ($M = 2.77, SD = 1.46$) was significantly lower than the mean desirability belief score for the human being condition ($M = 3.74, SD = 2.32$), 95% CI = -1.87, -0.08.

There was a significant difference in normative beliefs across self-categorizations, Welch's $F(3, 133.58) = 9.15, est. \omega^2 = .158, p < .001$. Post hoc comparisons using the Games-Howell post-hoc test indicated that the mean normative belief score for the significant other condition ($M = 1.16, SD = 1.28$) was significantly higher than the mean normative belief score for the individual condition ($M = 0.37, SD = 0.67$), 95% CI = 0.31, 1.28, the American condition ($M = 0.25, SD = 0.50$), 95% CI = 0.46, 1.38, and the human being condition ($M = 0.34, SD = 0.63$), 95% CI = 0.35, 1.30.

There was a significant difference in attitudinal beliefs across self-categorizations, Welch's $F(3, 135.35) = 3.87, est. \omega^2 = .032, p = .011$. Post hoc comparisons using the Games-Howell post-hoc test indicated that the mean attitudinal belief score for the human being condition ($M = 3.43, SD = 0.29$) was significantly higher than the mean attitudinal belief score for the American condition ($M = 2.52, SD = 1.55$), 95% CI = -1.81, -0.02. See Table 18 for the ANOVAs across self-categorizations with identity salience and belief type as outcome variables. See Table 19 for post hoc analyses for the statistically significant ANOVAs across relational identities.

Table 18*One-way Analysis of Variance across Self-Categorization Conditions with Identity**Salience and Belief Type as Outcome Variables*

	Individual	Significant Other	American	Human		
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>F</i>	<i>p</i>
1. Identity Salience	5.55 (1.03) _a	6.07 (0.83) _b	5.20 (1.41) _a	6.15 (0.89) _b	1.81	.000
2. Feasibility/ Desirability Dominance	1.94 (2.91)	1.90 (3.46)	1.30 (2.05)	2.27 (2.57)	2.09	.104
3. Desirability Beliefs	3.65 (2.65) _{ab}	3.57 (2.65) _{ab}	2.77 (1.46) _a	3.74 (2.32) _b	4.14	.008
4. Attitudinal	3.34 (2.57) _{ab}	2.43 (2.20) _{ab}	2.52 (1.55) _a	3.44 (2.67) _b	3.87	.011
5. Normative	0.37 (0.67) _a	1.16 (1.28) _b	0.25 (0.50) _a	0.34 (0.63) _a	9.15	.000
6. Feasibility Beliefs	1.71 (1.39)	1.67 (1.95)	1.45 (1.42)	1.59 (1.47)	0.45	.717
7. Pro/Con Dominance	-1.26 (3.43)	-1.13 (3.65)	-2.13 (2.92)	-1.78 (3.65)	1.302	.274
8. Pros	2.05 (1.74) _a	2.07 (2.09) _a	1.04 (1.44) _b	2.03 (2.62) _a	6.38	.000
9. Cons	3.30 (2.75)	3.20 (2.68)	3.20 (2.08)	3.21 (2.03)	.029	.993

Note. _{a-b}Means in a row without a common subscript differ significantly ($p < .05$), as

analyzed by post hoc analyses of Welch's one-way ANOVAs except for feasibility

beliefs, which met the assumption of homogeneity of variance and so were tested using

ANOVA. For analyses 2 and 7, negative scores indicate a predominance of feasibility or

con beliefs and positive scores indicate a predominance of desirability or pro beliefs. For

analysis 1, scores ranged from 0-7. For all other analyses, scores represent count data

where 0 indicates the absence of a belief type.

Table 19*Post hoc Analyses of Belief Types Differing Significantly across Identities*

	(I) Group	(J) Group	Mean Difference (I-J)	SE	p	95% CI	
						LL	UL
Identity Salience	A	I	-0.35	.21	.360	-0.90	0.20
		SO	-0.87	.20	.000	-1.39	-0.35*
		H	-0.95	.20	.000	-1.48	-0.42*
Desirability	I	SO	-0.52	.17	.011	-0.95	-0.09*
		H	-0.60	.17	.003	-1.05	-0.16*
	A	I	-0.35	.21	.360	-0.90	0.20
		I	-0.88	.37	.087	-1.85	0.08
	SO	SO	-0.81	.38	.158	-1.80	0.19
		H	-0.97	.34	.028	-1.87	-0.08*
Attitudinal	I	SO	0.08	.47	.998	-1.15	1.30
		H	-0.09	.44	.997	-1.24	1.06
	SO	H	-0.17	.45	.982	-1.34	1.00
		I	-0.82	.37	.127	-1.78	0.15
	A	SO	0.10	.34	.992	-0.79	0.98
		H	-0.01	.34	.044	-1.81	-0.19*
Normative	I	SO	0.91	.43	.145	-0.20	2.02
		H	-0.10	.43	.996	-1.21	1.02
	SO	H	-1.01	.40	.064	-2.06	.040
		I	-0.12	.10	.632	-0.39	0.14
	A	SO	-0.92	.17	.000	0.46	1.38*
		H	-0.09	.10	.790	-0.35	0.17
Pros	I	SO	-0.79	.18	.000	-1.28	-0.31*
		H	0.03	.11	.993	-0.27	0.33
	SO	H	0.82	.18	.000	0.35	1.30*
		I	-1.00	.27	.002	-1.72	-0.28*
	A	SO	-1.02	.32	.009	-1.85	-0.19
		H	-0.99	.37	.048	-1.97	.001*
SO	SO	-0.02	.34	1.00	-0.91	0.87	
	H	0.01	.40	1.00	-1.02	1.05	
A	SO	0.03	.43	1.00	-1.08	1.15	

Note. I = individual; SO = significant other; A = American; H = human; LL = lower

limit; UL = upper limit.

* $p < .05$.

4.2.2 Self-Categorization Effects on Generation of Pros and Cons

To examine whether taking on different identities influenced generation of pros and cons, I coded all feasibility and desirability beliefs categorically as either positive or negative use (see Section 3.3.2). Again, I conducted a one-way ANOVA where self-categorization is the factor with four levels (i.e., individual, significant other, American, human being). There was no significant difference between pro/con dominance scores based on self-categorization, $F(3, 255) = 1.30, \eta^2 = .015, p = .274$. See Table 20 for pro/con dominance scores across self-categorization and Table 21 for proportion of pro and con beliefs relative to feasibility and desirability beliefs across self-categorization.

Table 20

Means and Standard Deviations on Pro/Con Belief Dominance across Self-Categorization

Self-Categorization	<i>n</i>	<i>M</i>	<i>SD</i>
Individual	66	-1.26	3.43
Significant Other	61	-1.13	3.65
American	70	-2.13	2.92
Human Being	62	-1.18	3.65

Note. A negative score indicates a predominance of con beliefs, a positive score indicates a predominance of pro beliefs, and a score closer to 0 indicates a balance between pro and con beliefs.

Table 21

Proportion of Pro and Con Beliefs Relative to Feasibility and Desirability Beliefs across Self-Categorization

	Individual <i>M</i> (<i>SD</i>) %	Significant Other <i>M</i> (<i>SD</i>) %	American <i>M</i> (<i>SD</i>) %	Human <i>M</i> (<i>SD</i>) %
Pros	2.04 (1.74)	2.06 (2.09)	1.13 (1.60)	2.03 (2.62)
	38.24%	39.25%	26.33%	38.77%
Cons	3.30 (2.75)	3.20 (2.68)	3.16 (2.10)	3.21 (2.03)
	61.76%	60.75%	73.67%	61.23%

There was a significant difference in pro beliefs across self-categorizations, Welch's $F(3, 135.52) = 6.38$, $est. \omega^2 = .036$, $p < .001$. Post hoc comparisons using the Games-Howell post-hoc test indicated that the average number of pro beliefs for the American condition ($M = 1.04$, $SD = 1.44$) was significantly lower than the average number of pro beliefs for the individual condition ($M = 2.04$, $SD = 1.74$), 95% CI = -1.72, -0.28, the significant other condition ($M = 2.07$, $SD = 2.09$), 95% CI = -1.85, -0.19, and the human condition ($M = 2.03$, $SD = 2.62$), CI = -1.97, -0.01.

There was no significant difference in the average number of con beliefs across relational identities, $F(2, 254) = 0.029$, $\eta^2 = .00$, $p = .993$.

4.2.3 Exploratory Factor Analysis of Closed-Ended Belief Items

The factorability of all belief items was examined. I first conducted data screening to ensure that absolute skewness values were not greater than 2.0 and kurtosis values were not greater than 2.0, as that may result in the formation of artifactual factors, meaning factors that reflect similarities in item distributions rather than item content (Bandalos & Finney, 2019). One item, concerning the possibility of using prescription

opioids to relieve pain, had a kurtosis value of 2.316, which is above the recommended 2.0 threshold. However, all other skewness and kurtosis values were adequate and so data were considered approximately normally distributed. Several well-recognized criterion for factorability were used: the Kaiser-Meyer-Olkin measure of sampling adequacy was above the commonly recommended threshold of .6 (i.e., .855), and Bartlett's test of sphericity was significant ($\chi^2 (171) = 1791.50, p < .001$) (Hair et al., 2010).

Maximum likelihood (ML) was used for extraction because it explicitly accounts for the fact that a sample matrix is being analyzed rather than a population matrix and is therefore an inferential method that seeks a solution that best reproduces the population correlation values (Bandalos & Finney, 2019). Initial eigen values (i.e., before rotation) derived from EFA of the items indicated that the first two factors explained 26.89% and 17.86% of the variance, respectively. The two-factor solution, which explained 44.73% of the variance was preferred because of the leveling off of the eigen values after two factors on the scree plot. Oblimin rotation, an oblique rotation method that allows correlated factors, provided the best-defined factor structure. However, not all items in this analysis had primary factor loadings over .5, which is generally considered necessary for practical significance (Hair et al., 2010). Items without primary factor loadings over .5 included the following: cost (.243), safeguards from addiction (.486), prevent others from accessing (.446), alter to avoid side effects (.461), improve relationships (.422), and trust healthcare provider (.448). Cost was deleted from analysis because it had the lowest factor loading of those items without factor loadings of practical significance. This process of deleting variables with less than .5 loadings was continued one at a time in the following order to ensure that the larger factor structure did not change based on variable

elimination: improve relations (.426), trust healthcare provider (.425), prevent others (.448), altering use to avoid side effects (.463), and stigma (.474). After these items were eliminated, items were assessed to determine whether they contributed to a simple factor structure. Simple factor structure occurs when items load highly on only one factor (Kaiser, 1958). As Hair et al. note, “if a variable persists in having cross-loadings it becomes a candidate for deletion” (2010, p. 119). Two variables had cross-loadings (i.e., short use of opioids [.324, .529]; safeguards [.516, .286]). These variables were deleted. After these variables were deleted, alternatives to use loading fell below .5 (.489) and so the variable was deleted. See Table 24 for the final items included in EFA.

For the final stage, two EFAs of the remaining fifteen items using varimax and oblimin rotations were conducted. These rotations were compared because they represent orthogonal (i.e., uncorrelated factors; varimax) and oblique (i.e., correlated factors; oblimin) rotations. Given that EFA is exploratory, “it is acceptable to obtain both orthogonal and oblique rotations and compare results” to select the more interpretable and theoretically justifiable model (Bandalos & Finney, 2019, p. 105). These specific orthogonal and oblique rotations were selected because varimax seeks a simple structure where “each factor has small number of large loadings and a large number of zero (or small) loadings” and therefore produces easily interpretable factors (Abdi, 2003, p. 792). Direct oblimin rotation allows the researcher to control for how close the axes to come together via the delta parameter so that researchers can allow flexibility in terms of how much the factors are correlated but not allow them to correlate so closely that factors are uninterpretable (Clarkson & Jennrich, 1988). Oblimin rotation provided the best-defined

and most interpretable factor structure. The factor pattern loading matrix for this final solution is presented in Table 22.

Table 22

Factor Loadings and Communalities from Exploratory Factor Analysis with Oblimin

Rotation for Belief Items

Item	Con Focus	Pro Focus	Communality
As an American, does concern about addiction influence whether you would use prescription opioids?	.677	.075	.466
As an American, does concern that addiction may harm your relationships influence whether you would use prescription opioids?	.849	-.005	.721
As an American, does the possibility that opioid use may hurt your relationships influence whether you would use prescription opioids?	.834	-.005	.696
As an American, would fear or nervousness about using opioids influence your ability to use prescription opioids?	.660	-.065	.440
As an American, does the possibility of improved mental health influence whether you would use prescription opioids?	-.003	.660	.436
As an American, does the possibility of improved physical functioning influence whether you would use prescription opioids?	-.088	.797	.641
As an American, does the possibility of relieving pain	-.061	.829	.687

influence whether you would use prescription opioids?			
As an American, would your healthcare provider's willingness to prescribe opioids influence your ability to use prescription opioids?	.038	.553	.307
As an American, would the inability to handle pain without prescription opioids -influence your ability to use prescription opioids?	.071	.529	.285

The factors were labeled as pro focus and con focus. The con focus factor contained the following items: concern about addiction, concern that addiction may harm relationships, possibility that opioid use may hurt relationships, and fear or nervousness about using opioids. This factor was termed “con focus” because it contains items that speak to reasons against using prescription opioids. These specific items that make up the con focus factor have been found in other research (Brooks et al., 2015; Kennedy et al., 2017; Lewis et al., 2010).

The pro factor contained the following items: improved mental health, improved physical functioning, relieving pain, healthcare provider’s willingness to prescribe opioids, and inability to handle pain without prescription opioids. This factor was termed “pro focus” because it contains items that speak to reasons to use prescription opioids. These specific items that make up the con focus factor have been found in other research (Brooks et al., 2015; Kennedy et al., 2017; Lewis et al., 2010; Weiss et al., 2014).

4.2.4 Measurement Model

A CFA was conducted for the measures for all four factors (i.e., identity salience, psychological distance, con focus, and pro focus) included in the proposed model. Fit

indices were examined using the cutoff values suggested by Hu and Bentler (1999): SRMR .08, RMSEA .06, and CFI .95. One fit index of the model was acceptable (SRMR = .072) however the other fit indices were unacceptable, (RMSEA = .070, CFI = .884). The modification indices suggested one error covariance (the hypothetical and social items of psychological distance) should be added. This was probably because all items measuring psychological distance were similarly worded (i.e., “to what extent did thought listing make...”). Another CFA was conducted after adding the error covariance and the modification indices were examined again. The same procedures were repeated fourteen times until additional modifications did not substantially improve model fit. The fit indices of the model in each step, as well as the added error covariances and the reasons to add them can be found in Table 23. The final model achieved good fit, (150, $N = 247$) = 195.401, $p = .007$; RMSEA = .035, CFI = .973, SRMR = .059.

Table 23

Fit Indices of the Measurement Models and Reasons for Modifications (N = 247)

Model	χ^2	df	p	CFI	RMSEA	90% CI	SRMR	Modification	Reasons for Modification
1	361.238	164	<.001	.884	.070	[.060, .080]	.072	N/A	N/A
2	324.670	163	<.001	.905	.063	[.053, .073]	.071	Added one error covariance	Similarly worded items
3	298.310	162	<.001	.920	.058	[.048, .069]	.069	Added one error covariance	Similar content

4	282.30 6	16 1	<.00 1	.92 9	.055	[.04 4, .066]	.068	Added one error covariance	Similar content
5	269.82 5	16 0	<.00 1	.93 6	.053	[.04 2, .063]	.068	Added one error covariance	Similar content
6	261.74 5	15 9	<.00 1	.94 0	.051	[.04 0, .062]	.068	Added one error covariance	Similar content
7	257.04 2	15 8	<.00 1	.94 2	.050	[.03 9, .061]	.067	Added one error covariance	Similarly worded items
8	253.22 3	15 7	<.00 1	.94 4	.050	[.03 8, .061]	.066	Added one error covariance	Similar content
9	245.86 9	15 6	<.00 1	.94 7	.048	[.03 6, .060]	.065	Added one error covariance	Similar content
10	230.01 9	15 5	<.00 1	.95 6	.044	[.03 2, .056]	.063	Added one error covariance	Similar content
11	221.44 4	15 4	<.00 1	.96 0	.042	[.02 9, .054]	.062	Added one error covariance	Similar content
12	211.54 0	15 3	<.00 1	.96 6	.039	[.02 5, .052]	.062	Added one error covariance	Similarly worded items
13	205.44 6	15 2	=.00 3	.96 9	.038	[.02 3, .050]	.060	Added one error covariance	Similar content
14	200.53 9	15 1	=.00 4	.97 1	.036	[.02 1, .049]	.060	Added one error covariance	Similarly worded items

15	195.40	15	=.00	.07	.035	[.01	.059	Added one	Similarly
	1	0	7	3		9,		error	worded
						.048		covariance	items
]			

The reliability measures (i.e., coefficient *H*s) of the factors are in table 26. Coefficient *H* was used as the estimate of reliability instead of Cronbach's because Cronbach's assumes tau equivalence (i.e., all factor loadings are the same), an assumption not met by this data. Coefficient *H* does not assume tau equivalence (McNeish, 2018). As indicated in table 24, all measures were reliable (i.e., coefficient *H*s > .70).

Table 24

Coefficient Hs of the Factors in the Study 1(N = 247)

Factor	Coefficient <i>H</i>
Pro Beliefs	.807
Con Beliefs	.799
Identity Salience	.891
Psychological Distance	.850

4.2.5 Structural Model

Building off of the measurement model, the structural relations between the factors and the manipulated variable self-categorization condition were specified based on the proposed theoretical models (see Figures 3-5 Section 2.4). Therefore, I ran three models that altered the relations between the variables drawn from construal level theory: model 1 with psychological distance mediating the relationship between identity salience and beliefs, model 2 with beliefs mediating the relationship between identity salience and psychological distance, and model 3 where psychological distance and beliefs were simply allowed to covary. Covariates were also introduced into each model by entering

the measured covariates as predictors for all paths where they were expected to influence the outcome variable. See Table 25 for fit indices of the structural models. Because models 1-3 were non-nested, meaning that the models are not special cases of each other where parameters of one model can be fixed/constrained to yield another model, I compared the models using the Akaike Information Criterion (AIC) (Mueller & Hancock, 2019). Models with smaller AIC values are preferred over models with larger AIC values (Mueller & Hancock, 2019).

Table 25

Fit Indices of the Structural Models in Study 1 Individual Comparison Group (N = 247)

Model	χ^2	df	p	CFI	RMSEA	90% CI	SRMR	AIC
1	646.379	433	<.001	.894	.045	[.037, .052]	.062	19789.235
2	686.824	432	<.001	.873	.049	[.042, .056]	.060	19831.680
3	625.420	432	<.001	.904	.043	[.035, .050]	.058	19770.276

Based on the AIC values, model 3 was preferred. A comparison of fit indices for the final measurement model and Model 3 was conducted. Mueller and Hancock (2019) recommend that the initial structural model be compared to the final measurement model that it is nested within using a χ^2 difference test to assess statistical difference between the two. Compared to the final measurement model, the initial structural model had significantly worse fit $\Delta\chi^2 = 430.019$, $df = 282$, $p < .001$. However, fit difference between a measurement model and a structural model is to be expected because structural perfection is unlikely (Mueller & Hancock, 2019). Furthermore, the SRMR and RMSEA indices indicated acceptable model fit according to Hu and Bentler's (1999) recommendations, though the CFI was lower than suggested by Hu and Bentler (1999). In order to improve model fit I consulted the model modification indices and made three

model modifications allowing the error terms of several items to covary, resulting in the final model fit ($429, N = 247$) = 600.461, $p < .001$; RMSEA = .040, CFI = .915, SRMR = .057. Based on Hu and Bentler's (1999) recommendations for model fit regarding RMSEA and SRMR and Hair and colleagues' (2010) .90 CFI recommendation, model 3 fit was deemed acceptable and so the model was retained as tenable and individual parameter estimates were interpreted. The proportion of explained variance (R^2) of all the endogenous variables can be found in Table 26, and the standardized path coefficients can be found in Table 27. I now turn to model interpretation using standardized path coefficients.

Table 26

Proportion of Variance Explained in Endogenous Variables in the Final Structural

Model (N = 247)

Factor	R^2
Identity Saliency	.151
Con Focus	.114
Pro Focus	.121
Psychological Distance	.159
Likelihood of Using Prescription Opioids	.522

Table 27

Unstandardized and Standardized Path Coefficients of the Final Structural Model (N =

247)

Path	Path Coefficient Unstandardized	Path Coefficient Standardized
Predicting Identity Saliency		
Significant Other Condition	.360(.142)	.184**
American Condition	-.341(.162)	-.185**
Human Being	.451(.143)	.234**
Age	-.001(.004)	-.019
Gender	.037(.110)	.022

Predicting Con Focus		
Identity Saliency	-.030(.062)	-.037
Gender	.144(.112)	.106
Race	-.033(.141)	-.017
Age	-.001(.005)	-.024
Education	.085(.052)	.158*
Household Income	.005(.020)	.018
Used Opioid	-.123(.197)	-.046
Prescribed Opioid	.030(.237)	.011
Painful Condition	-.060(.129)	-.044
Disabling Pain	.435(.190)	.251**
Family Substance Use Disorder	-.137(.139)	-.102
Family Chronic Pain	-.154(.129)	-.116
Current Addiction to Opioids	.305(.142)	.122**
Predicting Pro Focus		
Identity Saliency	.331(.130)	.290**
Gender	.145(.142)	.076
Race	-.110(.166)	-.041
Age	.005(.007)	.063
Education	.056(.053)	.074
Household Income	.011(.025)	.033
Used Opioid	.060(.267)	.016
Prescribed Opioid	.096(.272)	.026
Painful Condition	.139(.174)	.071
Disabling Pain	-.321(.226)	-.131
Family Substance Use Disorder	.087(.166)	.046
Family Chronic Pain	-.025(.167)	-.013
Current Addiction to Opioids	.252(.270)	.072
Path	Path Coefficient Unstandardized	Path Coefficient Standardized
Predicting Psychological Distance		
Identity Saliency	-.245(.130)	-.168*
Gender	.206(.181)	.084
Race	.156(.242)	.045
Age	-.000(.007)	-.003
Education	.191(.068)	.197**
Household Income	.004(.031)	.009
Used Opioid	1.045(.389)	.215**
Prescribed Opioid	-.153(.327)	-.032
Painful Condition	-.413(.247)	-.165*

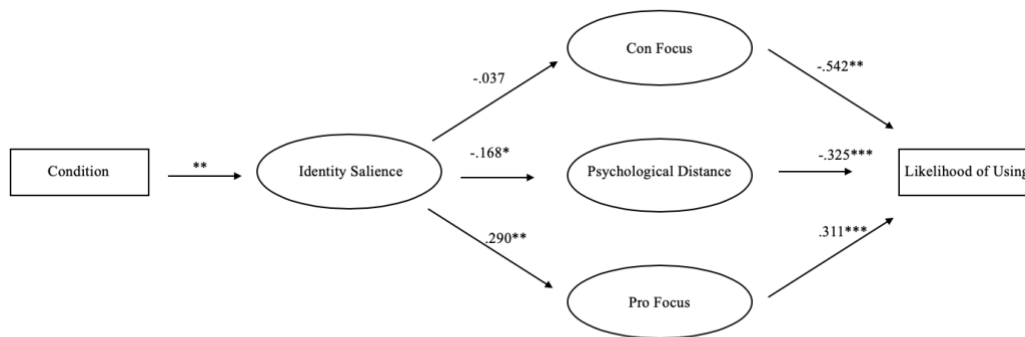
Disabling Pain	.390(.311)	.125
Family Substance Use Disorder	.197 (.194)	.081
Family Chronic Pain	-.077(.202)	-.032
Current Addiction to Opioids	-.192(.352)	-.043
Predicting Likelihood of Using		
Pro Focus	10.321(2.783)	.311***
Con Focus	-25.415(10.011)	-.542**
Psychological Distance	-8.449(2.013)	-.325***
Gender	3.333(3.509)	.052
Race	4.982(4.277)	.056
Age	-.050(.129)	-.019
Education	2.150(1.636)	.085
Household Income	-.557(.630)	-.048
Used Opioid	-11.217(11.606)	-.089
Prescribed Opioid	7.775(8.529)	.063
Painful Condition	-7.574(4.039)	-.117*
Disabling Pain	4.713(6.263)	.058
Family Substance Use Disorder	3.199(3.682)	.051
Family Chronic Pain	-2.653(4.039)	-.043
Current Addiction to Opioids	5.711(7.748)	.049

Note. All conditions were compared to the individual condition.

* $p \leq .10$, ** $p < .05$, *** $p < .001$.

Figure 7

Structural Model Predicting Likelihood of Using Prescription Opioids based on the Serial Mediation of Self-Categorization



Note. Condition was coded such that individual self-categorization served as the reference category. Scores closer to 1 indicated greater psychological distance from prescription opioid use, larger scores indicate less psychological distance from prescription opioid use.

* $p \leq .10$, ** $p < .05$, *** $p < .001$.

Figure 7 shows the final structural model illustrating the effect of self-categorization condition on likelihood of using prescription opioids through the serial mediation of identity salience, con focus, pro focus, and psychological distance.

Identity salience. Identity salience was significantly predicted by self-categorization condition. Compared to the individual condition, being in the significant other and human being conditions resulted in significantly higher identity salience (significant other, $\beta = .184$, $p = .011$; human, $\beta = .234$, $p = .002$). Conversely, compared to the individual condition, being in the American condition resulted in significantly lower identity salience ($\beta = -.185$, $p = .036$). Neither age nor gender significantly predicted identity salience.

In order to further understand the effect of self-categorization condition on identity salience, I ran an ANOVA with condition as the between-subjects factor with

four levels (i.e., individual, significant other, American, human being) (See Table 28).

There was a significant difference in identity salience across self-categorization conditions Welch's $F(3, 141.37) = 10.49$, *est.* $\omega^2 = .095$, $p < .001$. Post hoc comparisons using Games-Howell tests indicated that the mean identity salience score for the individual condition ($M = 5.55$, $SD = 1.03$) was significantly lower than the significant other condition ($M = 6.07$, $SD = 0.83$), 95% CI of the mean difference = -0.95, -0.09, and the human being condition ($M = 6.16$, $SD = 0.89$), 95% CI = -1.05, -0.16. However, the American condition ($M = 5.20$, $SD = 1.41$) did not differ significantly from the unique individual condition, 95% CI = -0.90, 0.20. The mean score for the significant other condition was significantly higher than the American condition, 95% CI = 0.35, 1.39. The mean identity salience score for the American condition was significantly lower than the human being condition, 95% CI = -1.48, -0.42. See Table 29 for the results of identity salience post hoc analyses.

Table 28

One-way Analysis of Variance in Identity Salience across Self-Categorization Condition

Individual	Significant Other	American	Human Being	$F(3,$	p
$M (SD)$	$M (SD)$	$M (SD)$	$M (SD)$	141.37)	
5.55 (1.03) _a	6.07 (0.83) _b	5.20 (1.41) _a	6.15 (0.89) _b	10.49	.000

Note. a-b Means in a row without a common subscript differ significantly ($p < .05$), as

analyzed by a one-way ANOVA. Scores closer to 1 indicate less identity salience and scores closer to 7 indicate greater identity salience.

Table 29

Post hoc Analyses of Identity Salience Differing Significantly across Self-Categorization Conditions

(I) Group	(J) Group	Mean Difference (I-J)	SE	p	95% CI	
					LL	UL
I	SO	-0.52	.17	.011	-0.95	-0.09
	A	0.35	.21	.360	-0.20	0.89
	H	-0.60	.17	.003	-1.05	-0.16
SO	A	0.87	.20	.001	0.35	1.39
	H	-0.08	.15	.949	-0.49	0.32
A	H	-0.95	.20	.000	-1.48	-0.42

Note: I = individual; SO = significant other; A = American; H = human; LL = lower

limit; UL = upper limit. Identity salience did not meet the assumption of homogeneity of variance and so Welch's ANOVA was used with Games-Howell post hoc tests.

Pro focus. Pro-behavior focus was expected to increase as consideration of prescription opioid use occurred from increasingly inclusive self-categorizations through the mediating variable of identity salience. Identity salience significantly positively predicted pro focus, $\beta = .290$, $p = .011$. Being in the human condition or significant other condition significantly indirectly predicted greater pro focus through identity salience than those in the individual condition (significant other, $\beta = .053$, $p = .069$; human being, $\beta = .053$, $p = .046$). Compared to the individual condition, being in the American condition did not significantly differ in predicting pro focus through identity salience (American, $\beta = -.054$, $p = .140$). No covariate significantly predicted pro focus.

Con focus. Conversely, con-behavior focus was expected to decrease as consideration of prescription opioid use occurred from increasingly inclusive self-categorizations through the mediating variable of identity salience. Identity salience did not significantly predict con focus, $\beta = -.037$, $p = .637$. Furthermore, there was no indirect effect of condition on con focus through identity salience (significant other, $\beta = -.007$, $p = .666$; American, $\beta = .007$, $p = .666$; human being, $\beta = -.009$, $p = .656$). In terms of covariates, only current addiction to pain medication ($\beta = .122$, $p = .031$) and being

disabled by pain ($\beta = .251, p = .022$) significantly predicted con focus, though education level was marginally significant ($\beta = .158, p = .100$).

Psychological distance. Psychological distance was expected to increase as consideration of prescription opioid use occurred from increasingly inclusive self-categorizations (i.e., moving from subordinate categorizations to relational, intermediate, and superordinate categorizations). Identity salience was marginally significant in predicting psychological distance ($\beta = -.245, p = .060, 95\% \text{ CI} = -0.51, 0.01$). There indirect effect of self-categorization condition on psychological distance through identity salience was also marginally significant (significant other, $\beta = -.031, p = .088$; American, $\beta = .031, p = .176$; human being, $\beta = -.039, p = .070$). Several covariates significantly predicted psychological distance, including education ($\beta = .197, p = .005$), having used an opioid in the past ($\beta = .215, p = .007$), and having a painful condition was marginally significant ($\beta = -.165, p = .094$).

Likelihood of Using Prescription Opioids. Likelihood of using prescription opioids was significantly positively predicted by pro focus ($\beta = .311, p < .001$), significantly negatively predicted by con focus ($\beta = -.542, p = .011$), and significantly negatively predicted by psychological distance ($\beta = -.325, p < .001$). No covariates significantly predicted likelihood of using prescription opioids but having a painful condition was marginally significant ($\beta = -.117, p = .061$). The indirect effect of the human being condition through identity salience and psychological distance on likelihood of using was marginally significant ($\beta = .013, p = .082$) as was the indirect effect of the significant other condition through identity salience and psychological distance on likelihood of using ($\beta = .010, p = .099$). Similarly, the indirect effect of the human being

condition through identity salience and pro focus on likelihood of using was significant ($\beta = .021, p = .053$) and the indirect effect of the significant other condition through identity salience and pro focus on likelihood of using was marginally significant ($\beta = .017, p = .083$).

4.3 Summary

In study 1, self-categorization was investigated as a message cue that influences construal level, psychological distance, and likelihood of using prescription opioids. As in the pilot study, participants considered prescription opioid use from a specific self-categorization and engaged in open-ended belief elicitation. Belief elicitation responses were quantitatively coded, and ANOVAs were used to examine differences in belief type across self-categorizations. Unlike the pilot study, participants were randomly assigned to one of four identities: individual, significant other, American, or human being, instead of self-selecting an identity. Analysis of thought listing data resulted in findings consistent with the pilot study. There was no significant difference in the amount of feasibility beliefs generated across self-categorizations. There were significant differences in the number of desirability beliefs generated between the American condition and the human being condition. Those in the human being condition listed more desirability beliefs than those in the American condition. Thus, study 1 thought listing partially supported hypothesis 1 because having a more inclusive self-categorization (i.e., human being) was associated with a greater number of desirability beliefs compared to a less inclusive self-categorization (i.e., American). When the focus shifted to whether beliefs elicited referred to pros or cons of prescription opioid use, there was no significant difference in the number of cons listed across self-categorization conditions. There was, however, a

significant difference in the number of pros listed such that those in the American condition listed fewer pros of prescription opioid use than those in the individual, significant other, and human being conditions. Ultimately, study 1 thought listing did not support hypothesis 2: self-categorization at increasingly inclusive levels was not associated with con focus and, while self-categorization was associated with pro focus, it was not associated in the hypothesized way.

After analyzing open-ended thought listing responses, I turned to participants' responses to the close-ended belief questions designed to ascertain psychological distance, identity salience, likelihood of using prescription opioids, feasibility beliefs, and desirability beliefs. The close-ended belief items were created based on the themes elicited in the pilot study. After conducting an EFA on the belief items, two factors emerged that were best described as pro and con focus—not feasibility and desirability beliefs as I had initially expected. Using structural equation modeling, three theory-based models were tested and compared. In the best fitting model, self-categorization at more inclusive levels positively predicted pro focus indirectly through identity salience for those in the significant other and human being condition as compared to the individual condition. Notably, however, the American condition did not differ from the individual condition in terms of pro focus. Furthermore, con focus was not predicted by self-categorization nor identity salience. Thus, hypothesis 2 was only partially supported: self-categorization at increasingly inclusive levels (i.e., moving from subordinate to relational, intermediate, and superordinate categorizations) is positively associated with pro focus but inclusivity of self-categorization is not negatively associated with con focus.

Self-categorization at more inclusive levels was marginally significant in predicting psychological distance indirectly through identity salience. The psychological distance factor in this study was coded such that scores closer to 1 indicated greater psychological distance (farther from the issue of prescription opioid use) and larger scores indicated less psychological distance (closer to the issue of prescription opioid use). Specifically, those in the significant other and human being condition had greater psychological distance from prescription opioid use as compared to those in the individual condition. While trending in the hypothesized direction, the data do not provide enough evidence to support hypothesis 3 that self-categorization at increasingly inclusive levels increases psychological distance.

Integrating the findings from belief elicitation responses to the pilot study and study 1, and structural equation modeling from study 1 allows us to draw several conclusions about patterns in the data. First, the number of feasibility beliefs related to the ability to use prescription opioids remained consistent regardless of self-categorization. Second, the number of con beliefs about prescription opioid use remained consistent regardless of self-categorization or identity salience. Third, while trending in the hypothesized direction, psychological distance was not significantly predicted by self-categorization or identity salience. Fourth, the number of desirability beliefs was significantly different based on self-categorization. Fifth, pro focus was significantly predicted by self-categorization and identity salience. Despite the lack of support for hypothesized relationships, 52.2% of variance in likelihood to use prescription opioids was explained by the theoretical variables (i.e., psychological distance, con focus, pro focus) –no covariates significantly predicted likelihood to use prescription opioids. In the

context of prescription opioid use, psychological distance, con focus, and feasibility beliefs seem to be relatively stable, but desirability beliefs and pro focus seem responsive to changes in self-categorization. Thus, study 1 showed the possibility for self-categorization to influence construal level regarding prescription opioid use. Study 1 also demonstrated the importance of identity salience as a mediator between the intrinsic message feature self-categorization and the outcome of interest, construal level.

Chapter 5: Study 2

Study 2 examined self-categorization as a manipulated cue in a message about prescription opioid use. Specifically, the second study was undertaken to answer hypotheses 4 and 5 concerning how altering self-categorization in a message about the pros and cons of prescription opioid use influences attitudes, perceived behavioral control, subjective norms, and behavioral intent to use prescription opioids through the mediating factor identity salience.

Prior to study 2, I conducted a second pilot study using a sample of students from the SONA system at UMD. Pilot study 2 was undertaken to address concerns about the dimensionality of the TPB items across the self-categorization conditions. Specifically, I was concerned that by including self-categorization in the variable measures (e.g., as a significant other I intend to use prescription opioids when I feel pain) composing each theorized factor, the factor-variable relationships would differ across self-categorization conditions. In other words, the factor structure for the proximal determinants of behavior would be different for those in the individual, significant other, and human being conditions. I was particularly concerned about the factor-variable relationship for subjective norm. A person's subjective norm is related to the approval of behaviors by others and the actual behaviors of others. In specifying who those referent others are (e.g., significant other, human beings, people important to me) I worried that I would be eliciting subjective norms that were not comparable to each other because they tapped different constructs. To address these concerns, I used exploratory factor analysis with a unique sample of participants to examine whether the factor-variable relationship was influenced by self-categorization.

5.1 Pilot Study 2

In pilot study 2, I conducted an EFA using maximum likelihood extraction in SPSS version 25 in order to examine the relationship between measurement items and latent variables. The EFA used a unique sample of participants to identify the latent constructs driving variation in the proximal predictors of behavior (i.e., attitudes, subjective norms, perceived behavioral control, behavioral intent). EFA is appropriate because despite theoretical conceptualization of the proximal determinants of behavior, there has been no empirical evidence collected that speaks to the specific proximal determinants regarding prescription opioid use when viewed from distinct self-categorizations (i.e., unique individual, significant other, human being). Maximum likelihood (ML) was used for extraction because it explicitly accounts for the fact that a sample matrix is being analyzed rather than a population matrix and is therefore an inferential method that seeks a solution that best reproduces the population correlation values (Bandalos & Finney, 2019).

The procedures were approved by the University of Maryland Institutional Review Board on March 5, 2020. Given the expense of MTurk, participants for pilot study 2 were recruited from the communication participant pool at a large Mid-Atlantic university and were rewarded with a small amount of course credit. Participants provided data for pilot study 2 March 5 through May 10, 2020. A total of 131 participants completed the study. The factorability of all items was examined to ensure that absolute skewness values were not greater than 2.0 and kurtosis values were not greater than 2.0. Several well-recognized criteria for factorability were used: the Kaiser-Meyer-Olkin measure of sampling adequacy above the commonly recommended threshold of .6, and

Bartlett's test of sphericity was significant (Hair et al., 2010). Appropriateness of EFA methods and the factors extracted for each construct are presented below by theoretical construct.

Attitudes. All attitude items were screened, and no items had absolute skewness or kurtosis greater than 2 (see Appendix I). The Kaiser-Meyer-Olkin measure of sampling adequacy was above .6 (i.e., .917), and Bartlett's test of sphericity was significant ($\chi^2 (153) = 3145.85, p < .001$) (Hair et al., 2010). The one-factor solution, which explained 70.52% of the variance was preferred because of the leveling off of the eigen values after one factor on the scree plot.

Subjective norm. All subjective norm items were screened, and no items had absolute skewness or kurtosis greater than 2 (see Appendix J). The Kaiser-Meyer-Olkin measure of sampling adequacy was above .6 (i.e., .891), and Bartlett's test of sphericity was significant ($\chi^2 (45) = 675.844, p < .001$) (Hair et al., 2010). Eigen values indicated that the first factor explained 54.89% of the variance and the eigen values levelled off after one factor on the scree plot.

Perceived behavioral control. All perceived behavioral control items were screened, and no items had absolute skewness or kurtosis greater than 2 (see Appendix K). The Kaiser-Meyer-Olkin measure of sampling adequacy was above .6 (i.e., .767), and Bartlett's test of sphericity was significant ($\chi^2 (66) = 781.348, p < .001$) (Hair et al., 2010). Initial eigen values (i.e., before rotation) derived from EFA of the items indicated that the first three factors explained 33.64%, 25.07%, and 9.68% of the variance, respectively. The two-factor solution, which explained 58.71% of the variance was preferred because of the leveling off of the eigen values after two factors on the scree

plot. Oblimin rotation, an oblique rotation method that allows correlated factors, provided the best-defined factor structure.

Behavioral Intent. All behavioral intent items were screened, and no items had absolute skewness or kurtosis greater than 2 (see Appendix L). The Kaiser-Meyer-Olkin measure of sampling adequacy was above .6 (i.e., .918), and Bartlett's test of sphericity was significant ($\chi^2(66) = 1570.632, p < .001$) (Hair et al., 2010). The one-factor solution, which explained 67.83% of the variance was preferred because of the leveling off of the eigen values after one factor on the scree plot.

5.2 Study 2 Methods

After evaluating the dimensionality of the TPB items through EFA, which established that the factor-variable structure was the same across self-categorization conditions, I collected data from MTurk. Participants were randomly assigned to one of three message conditions manipulating self-categorization in order to assess hypotheses 4-6 concerning self-categorization as a message cue that influences the proximal determinants of behavior.

5.2.1 Participants

Data were collected May 1 through May 5, 2020. Participants were recruited from Amazon MTurk. Based on Monte Carlo simulation studies conducted by Wolf et al. (2013), at least 1800 participants were needed to ensure high power ($> .90$) and model convergence. In total, because of constraints due to time, the cost of data collection, and general consensus among scholars that power .80 is adequate (Cohen, 2013), thus the power parameters used by Wolf et al. were unnecessarily high, 1,200 participants were sampled. With the elimination of 17 participants who responded that their data should be

deleted and 41 participants who completed the study more than once¹¹, demographic data by self-categorization condition is listed in Table 30.

Table 30

Demographic Characteristics by Self-Categorization Condition

	Individual	Significant Other	Human Being
Sample Size	396	379	406
Age	35	35	34
Sex (Male)	245 ¹²	206	235
Ethnicity (White)	302	294	314
Income	50,000-59,999	50,000-59,999	50,000-59,999
Education	Bachelor's Degree	Bachelor's Degree	Bachelor's Degree

Note. Data on age and income are median values. Data on highest level of education are mode values.

Participants also provided information about their own and their family members' experiences with prescription opioid use, their own and their family members' experiences with chronic pain, and substance use disorders (see Table 31).

Table 31

Experience of Pain, Opioid Use, and Substance Use Disorder across Identity Conditions

	Individual	Significant Other	Human Being
Prescribed Opioid in 30 Days (Yes)	16.2%	14%	14.5%

¹¹ When participants completed the study more than once, their first response was kept but subsequent responses were deleted from the dataset.

¹² 3 participants in the individual condition selected "other" as a sex.

Used Opioid in 30 Days (Yes)	14.1%	13.5%	15%
Painful Condition (Yes)	31.1%	34%	33.3%
Disabling Pain (Yes)	20.2%	17.9%	20.7%
Family Chronic Pain (Yes)	42.9%	42%	43.1%
Family Substance Use (Yes)	36.1%	36.7%	36.5%
Addiction to Pain Medication (Yes)	12.1%	12.4%	13.3%

5.2.2 Measures

Most measures for study 2 were used in pilot study 1, including measures designed to assess experience with prescription opioid use, experience of pain and risk for problematic prescription opioid use, identity salience, and demographics. See section 3.2.2 for the description of these measures. Measures that were unique to study 2 included attitudes toward prescription opioid use, subjective norm regarding prescription opioid use, perceived behavioral control over prescription opioid, and behavioral intent to use prescription opioids. The mean value, standard deviation, skewness, and kurtosis for each of these measures are listed in Tables 32-35 following the description of each variable, as recommended by Bandalos and Finney (2019). All items were phrased so that participants would focus on their perceptions of prescription opioids use from an identity standpoint corresponding to the message they read (e.g., “As a unique individual/significant other/human being, if I wanted to, I could choose to use prescription opioids”).

Attitudes toward prescription opioid use. To measure attitudes, Ajzen (2002) recommends measures include an instrumental component represented by adjective pairs like valuable/worthless and harmful/beneficial, and an experiential component represented by adjective pairs like pleasant/unpleasant and enjoyable/unenjoyable. Attitude measures should also include a good/bad scale, which captures overall attitudes well. I adapted six 7-point semantic differential items from Dillard et al. (2007) that captured both instrumental and experiential components of attitudes.

Table 32

Means, Standard Deviations, Skewness, and Kurtosis of Attitude Items

Item	<i>M (SD)</i>	Skewness	Kurtosis
In your view as a unique individual, using prescription opioids is: Bad; Good	3.98(1.73)	-0.01	-0.80
In your view as a unique individual, using prescription opioids is: Unfavorable; Favorable	3.81(1.78)	0.06	-0.93
In your view as a unique individual, using prescription opioids is: Negative; Positive	3.88(1.75)	0.04	-0.83
In your view as a unique individual, using prescription opioids is: Undesirable; Desirable	4.33(1.78)	0.19	-0.89
In your view as a unique individual, using prescription opioids is: Unnecessary; Necessary	4.33(1.67)	-0.37	-0.51
In your view as a unique individual, using prescription opioids is: Harmful; Beneficial	4.02(1.80)	-0.13	-0.94

Perceived behavioral control over prescription opioid use. Ajzen (2002) recommends that items measuring PBC should capture people's confidence that they are capable of performing the behavior. There are two components to this belief: the difficulty of performing the behavior similar to the participant's sense of self-efficacy,

and the controllability of the behavior. The following items assessed self-efficacy: “If I wanted to, I could choose to use prescription opioids” and “for me to choose to use prescription opioid is impossible/possible.” The following items assessed controllability: “It is mostly up to me whether or not I use prescription opioids” and “How much control do you believe you have over using prescription opioids.” Except for the latter item, all items were measured on 7-point scales ranging from 1 = strongly disagree to 7 = strongly agree. The item asking how much control participants believed they have over using prescription opioids was measured on a 100-mm graphical rating scale with the anchors *no control* and *complete control*.

Table 33

Means, Standard Deviations, Skewness, and Kurtosis of Perceived Behavioral Control

Items

Item	<i>M (SD)</i>	Skewness	Kurtosis
As a unique individual, if I wanted to, I could choose to use prescription opioids.	4.97(1.62)	-1.00	0.20
As a unique individual, for me to choose to use prescription opioids is...Possible; Impossible	3.31(1.88)	0.50	-0.88
As a unique individual, it is mostly up to me whether or not I use prescription opioids.	5.31(1.43)	-0.99	0.50
As a unique individual, how much control do you believe you have over using opioids?	74.85(23.34)	-0.99	0.59

Subjective norm regarding prescription opioid use. Measures were formulated based on Ajzen (2002) recommendations to include items that capture injunctive norm, related to the approval of behaviors by others (e.g., Most people who are important to me/My significant other/Most human beings) think I should NOT use prescription

opioids), and descriptive norm, related to the actual behaviors of others (e.g., Most people who are important to me/My significant other/Most human beings) use prescription opioids). Participants rated their responses on 7-point scales ranging from 1 = strongly disagree to 7 = strongly agree.

Table 34

Means, Standard Deviations, Skewness, and Kurtosis of Subjective Norm Items

Item	<i>M (SD)</i>	Skewness	Kurtosis
Most people who are important to me think I should <u>NOT</u> use prescription opioids.	4.81(1.60)	-0.50	-0.51
The people in my life whose opinions I value would approve of my using prescription opioids.	3.89(1.73)	-0.06	-0.96
Most people who are important to me use prescription opioids.	3.09(1.88)	0.50	-1.06
The people whose opinions I value use prescription opioids.	3.30(1.79)	0.29	-1.10
The people in my life whose opinions I value would disapprove of my using prescription opioids.	4.59(1.64)	-0.41	-0.67

Behavioral intention to initiate prescription opioid use. Measures were formulated based on Ajzen's (2002) exemplar questions to measure behavioral intention. Three items were measured on a 7-point scale where 1 = *strongly disagree* and 7 = *strongly agree*. Participants were asked the extent to which they agree with the following: (a) I intend to use prescription opioids when I experience pain, (b) I will try NOT to use prescription opioids when I experience pain, and (c) I plan to use prescription opioids when I experience pain. Participants were also asked "How likely is it that you would use

prescription opioids” on a 100-point scale where 0 = *not at all likely* and 100 = *extremely likely*.

Table 35

Means, Standard Deviations, Skewness, and Kurtosis of Behavioral Intent Items

Item	<i>M (SD)</i>	Skewness	Kurtosis
As a unique individual, I intend to use prescription opioids when I feel pain.	3.74(1.83)	0.04	-1.15
As a unique individual, I will try <u>NOT</u> to use prescription opioids when I feel pain.	4.99(1.71)	-0.61	-0.66
As a unique individual, I plan to use prescription opioids when I experience pain.	3.74(1.83)	0.02	-1.19
As a unique individual, how likely is it that you would use prescription opioids?	42.70(29.99)	0.17	-1.12

Identity salience. Six items were adapted from previous research (Ma & Atwell Seate, 2017; Palomares, 2009) to assess participants’ level of identity salience on a 7-point scale (1 = *Strongly Disagree*, 4 = *Neither Agree nor Disagree*, 7 = *Strongly Agree*). All items were phrased so that participants would focus on their mental state while listing their thoughts from the self-categorization manipulation standpoint (e.g., “While listing my thoughts, I was thinking about being a unique individual/significant other/ human being”).

Table 36

Means, Standard Deviations, Skewness, and Kurtosis of Identity Salience Items

Item	<i>M (SD)</i>	Skewness	Kurtosis
While reading the message, I was thinking about being a unique individual.	4.76(1.76)	-0.65	-0.73
While reading the message, I thought being a unique individual was central to my identity.	4.60(1.76)	-0.44	-0.88

While reading the message, I was unaware of a being unique individual.	3.49(1.93)	0.28	-1.23
While reading the message, I thought being a unique individual was important.	4.81(1.67)	-0.58	-0.56
While reading the message, I thought being a unique individual came into play.	4.84(1.74)	-0.65	-0.63
While reading the message, I evaluated myself positively or negatively in terms of being a unique individual.	4.34(1.72)	-0.29	-0.91

5.2.3 Message Manipulation

Message manipulations were designed to ensure alignment with pilot study 1 and study 1 findings. Several experts who specialize in risk communication, the clear communication index, and health and regulatory communication specific to prescription opioids were consulted to ensure content and ecological validity. The pros and cons listed in each message were based on participants' thought listing responses in the pilot study 1 (see section 3.3.1) and validated by cross-checking participants' concerns with two existing scales: the prescribed opioids difficulties scale (Banta-Green et al., 2010) and the opioid prescription medication motives questionnaire (Jones et al., 2014). The prescribed opioids difficulties scale (PODS) consists of two sub-scales representing the two factors (opioid control concerns and psychosocial problems) found to represent the difficulties that patients attribute to chronic opioid therapy. The difficulties represented in the scale are based upon interviews with 1,144 patients who were long term opioid users (Banta-Green et al., 2010). The opioid prescription medication motives questionnaire was based on a survey of 337 college students and consists of four factors: enhancement, coping, social, and pain (Jones et al., 2014).

Specifically, in designing the message, I listed participants' pros and cons to initiate opioid use from the pilot study and study 1, reasons to use opioids identified in the opioid prescription medication motives questionnaire, and reasons not to use opioids from the prescribed opioids difficulties scale. I highlighted overlaps between the findings and select four pros and four cons of use to be included in messages.

Pros or cons related to relational concerns (e.g., potential for stigma, potential to harm parenting abilities, burdening one's partner, potential to improve relationships) were not included because of the possibility that these pros and cons would be uniquely aligned with the relational self-categorization. In other words, because these reasons to use or not use prescription opioids were based on relational concerns that may be irrelevant to the human or individual self-categorizations they were not included in the message. Furthermore, I focused only on proximal potential outcomes of prescription opioid use, meaning that I did not focus on outcomes of addiction (e.g., addiction may harm relationships). I edited the pros and cons to be similar in the number of words for each bullet-point.

The pros and cons were inserted into an altered message from the Centers for Disease Control and Prevention (2016) in order to increase ecological validity. The message included the heading "Prescription opioids: what you need to know" and a brief explanation of when prescription opioids are used and the importance of consulting with a health care provider to ensure getting the most effective and safe care. The message had two headings that read "what are the reasons to use opioids" (pro) and "what are the reasons not to use opioids" (con). These were followed by re-statement of reasons to use/reasons not to use and the four selected pros and cons in bulleted form.

The message was manipulated in the main header (e.g., Prescription opioids: What an individual needs to know), in both secondary headers (e.g., What are the reasons individuals use opioids; What are the reasons individuals do not use opioids), and in both re-statements (e.g., Reasons to use opioids as an individual include; Reasons not to use opioids as an individual include). The message was counterbalanced so that within each condition an equal number of participants saw the message listed with pros of using prescription opioids first, cons second, and vice versa. See Figure 8 for the message featuring the pros and cons of prescription opioid use manipulated for the significant other condition.

Figure 8

Message with Pros and Cons of Prescription Opioid Use Manipulated for the Significant Other Condition



Prescription opioids can be used to help relieve severe pain and are often prescribed following a surgery or injury, or for certain health conditions. These medicines can be an important part of treatment but also come with serious risks. It is important to work with your health care provider to make sure you are getting the safest, most effective care. Talk to your health care provider to make sure you understand the reasons to use and not use opioids. If you and your doctor determine that opioids should be included in your treatment plan, you should use the lowest dose for the shortest time needed.

WHAT ARE THE REASONS SIGNIFICANT OTHERS USE OPIOIDS?

Reasons significant others use opioids include:

- Feeling less physical pain
- Able to move easily
- Sleeping better
- Participating in work and other activities

WHAT ARE THE REASONS SIGNIFICANT OTHERS DO NOT USE OPIOIDS?

Reasons significant others do not use opioids include:

- Feeling tired or slow
- Finding it hard to focus
- Losing interest in usual activities
- Taking or craving more opioids than prescribed

Finally, the message was reviewed by experts specializing in health and regulatory communication regarding prescription opioids, risk communication, and the Clear Communication Index (Baur & Prue, 2014). First, the message was reviewed for factual accuracy and ecological validity by two social scientists at the Food and Drug Administration who specialize in regulatory messaging about prescription opioids. I was able to address most of their concerns. However, the FDA does not frame messages in terms of reasons to use or not use prescription drugs and therefore the manipulated headers “What are the reasons to use opioids?” and “What are the reasons not to use opioids?” would not appear in FDA messages. This was an issue that I was not able to

address. Still, this does not preclude me from examining the influence of pro/con framing on persuasive outcomes. Messages were also reviewed by a risk communication expert and an expert in the Centers for Disease Control and Prevention Clear Communication Index to ensure that characteristics that enhance clarity and aid understanding of public health messages are present in the message manipulations (Baur & Prue, 2014).

5.2.4 Procedure

After responding to the HIT, providing consent (see Appendix B), and completing a Captcha verification question designed to ensure that participants are real humans¹³, participants were randomly assigned to one of three message conditions: unique individual (subordinate), significant other (relational), and human being (superordinate). Participants were asked to read the message in its entirety and advised that they would be unable to move forward in the survey until 60 seconds had elapsed. Participants then completed batteries of questions measuring identity salience, their attitudes toward initiating prescription opioid use, subjective norms regarding prescription opioid use, perceived behavioral control over initiating prescription opioid use, and behavioral intention to initiate prescription opioid use. Finally, participants provided demographic information (see Appendix D) and answered questions regarding their own and their immediate family's past experiences with prescription opioid use, pain, and substance use disorder.

¹³ Captcha was included to ensure that participants were real humans rather than bots, which are computer programs that automatically complete HITs thereby providing invalid responses. The presence of bots on Mturk was demonstrated in study 1 where 41 responses were assessed as likely from bots and subsequently deleted.

5.2.5 Data Analysis

I took a two-step approach to latent variable path analysis to ensure that the measurement model achieves adequate fit because if the measurement model does not achieve adequate fit then the structural model will certainly not achieve adequate fit (Mueller & Hancock, 2019). First, I assessed the measurement model, to examine whether the data support a priori structural connections between latent constructs and measured items and where all latent factors are allowed to covary freely (Mueller & Hancock, 2019). Second, I assessed the structural model to test the study's hypotheses.

Measurement phase. As part of the two-step approach to latent variable path modeling (Mueller & Hancock, 2019), I first assessed the measurement model where all items are specified under the latent factors they indicate, and all latent factors are allowed to covary. The measurement model was based on the findings of the pilot study 2 EFA which largely supported that the item wording suggested by Ajzen (2002) aligned with the factors of attitude, subjective norm, and behavioral intent, all of which were found to be unidimensional. EFA revealed two factors driving variation in the four perceived behavioral control items, which aligns with theory if we consider that those factors represented controllability of the behavior and self-efficacy to perform the behavior. A CFA with maximum likelihood extraction and Satorra-Bentler corrections to address the nonnormality of the data was run RStudio version 1.2.5003 using the Lavaan package (Rosseel, 2012) to model the relations among items as stemming from latent variables. A CFA was appropriate given that the structure of all latent variables has been studied using EFA with an independent source of data (see section 5.1; Bandalos & Finney, 2019).

Structural Phase. I dummy coded the message manipulation (i.e., unique individual, significant other, human being). Both human being and individual conditions were run as the reference group in separate analyses and there were no differences in model fit¹⁴. Individual was chosen as the reference group to allow for comparison with Study 1. Retaining the final measurement model, the structural model including paths between the latent and manipulated variables were specified. There were no issues with convergence, estimates, or identification with the structural model (Mueller & Hancock, 2019). Endogenous latent variables were scaled using the default in the Lavaan package (Rosseel, 2012) by fixing a path to one of their indicator variables to 1.

5.3 Results

5.3.1 Measurement Model

A CFA was conducted for the measures for the factors included in the proposed model (i.e., identity salience, attitudes, subjective norms, perceived behavioral control, and behavioral intent). The factorability of all items from the MTurk sample was examined. I again conducted data screening to ensure that absolute univariate skewness and kurtosis values were not greater than 2.0, which they were. In terms of kurtosis, Mardia's normalized multivariate kurtosis coefficient was significant, $p = 0$. The lack of multivariate normality may result in underestimation of standard errors and inflation of chi-square values, thus biasing fit indices based on chi-square (Bandalos & Finney, 2019). Given the nonnormality of the data, the Satorra-Bentler adjustment to the standard

¹⁴ Fit indices for the model when human being condition was the reference group (490, $N = 1181$) = 1698.095, $p < .001$; RMSEA = .050, CFI = .933, SRMR = .075 were not meaningfully different from fit indices for the model when individual condition was the reference group: (490, $N = 1181$) = 1698.097, $p < .001$; RMSEA = .050, CFI = .933, SRMR = .074.

errors and chi-square values was implemented. Univariate outliers were screened by looking for cases with large z-scores (i.e., +/- 3 standard deviations from the mean). Several univariate outliers were identified all with z-scores > -3 . Mahalanobis D was used to screen for multivariate outliers of which there were 77 multivariate outliers. Estimates of the data were obtained with and without univariate and multivariate outliers as suggested by Bandalos and Finney (2019). The estimates were the same regardless of whether univariate and multivariate outliers were included or excluded and so the outliers were kept in the final data set used to run analyses, as recommended by Bandalos and Finney (2019).

Several difficulties occurred during the measurement phase of structural equation modeling. The CFA was initially run with perceived behavioral control modeled as a second order factor with two first-order factors emerging from two items each. Perceived behavioral control was modeled in this way because EFA suggested a two-factor structure for perceived behavioral control (see section 5.1). A negative error variance estimate, also known as a Heywood case, occurred with two of the perceived behavioral control items, one per first-order factor. One item asked the extent to which participants agreed “if I wanted to, I could choose to use prescription opioids” and had a standardized error variance of -3.935. The other item asked the extent to which participants agreed “it is mostly up to me whether or not I use prescription opioids” and had a standardized error variance of -0.038. These items had negative error variance, indicating possible empirical under-identification because the relation of the factor to others within the model was estimated as zero or near zero (Mueller & Hancock, 2019). The two first-order perceived behavioral control latent factors were not indicated by a sufficient number of measured

variables, therefore I modeled the four perceived behavioral control items as single-item measured variables rather than latent variables or creating a composite of the items.

Fit indices were examined using the cutoff values suggested by Hu and Bentler (1999): SRMR .08, RMSEA .06, and CFI .95. The fit indices were unacceptable, SRMR = .088, RMSEA = .078, CFI = .943. Mueller and Hancock (2019) acknowledge that all models are only approximations of reality and therefore have some degree of misspecification. Addressing internal specification errors as indicated by modification indices can increase model fit, though re-specifications based on modification indices are data-driven and exploratory in nature (Mueller & Hancock, 2019). Still, I examined the modification indices, which suggested that one error covariance be added. Another CFA was conducted after adding the error covariance and the modification indices were examined again. The same procedures were repeated six times until additional modifications did not substantially improve model fit. The fit indices of the model in each step, as well as the added error covariances and the reasons to add them can be found in Table 37. The final model achieved satisfactory fit, $(166, N = 1181) = 750.041, p < .001$; RMSEA = .062, CFI = .965, SRMR = .087. As indicated in table 38, all factors were reliable (i.e., coefficient $H_s > .70$).

Table 37

Fit Indices of the Measurement Models and Reasons for Modifications (N = 1104)

Model	χ^2	<i>df</i>	<i>p</i>	CFI	RMSEA	90 % CI	SRMR	Modification	Reasons for Modification
1	1134.397	172	< .001	.943	.078	.074, .082	.088	N/A	N/A

2	998.909	17 1	< .00 1	.95 1	.073	.068 , .077	.099	Added one error covariance	Similar wording
3	953.023	17 0	< .00 1	.95 3	.071	.067 , .075	.095	Added one error covariance	Similar wording
4	844.578	16 9	< .00 1	.96 0	.066	.062 , .072	.088	Added one error covariance	Similar wording
5	810.746	16 8	< .00 1	.96 2	.065	.060 , .069	.087	Added one error covariance	Similar wording
6	789.853	16 7	< .00 1	.96 3	.064	.060 , .069	.087	Added one error covariance	Similar content
7	750.041	16 6	< .00 1	.96 5	.062	.058 , .067	.087	Added one error covariance	Similar content

Note. The model fit indices presented are robust model fit indices with Satorra-Bentler corrections.

Table 38

Coefficient Hs of the Factors in Study 2 (N = 1181)

Factor	Coefficient <i>H</i>
Identity Salience	.937
Attitudes	.966
Subjective Norms	.831
Behavioral Intent	.928

5.3.4 Structural Model

Building off of the measurement model, the structural relations between the latent factors (i.e., identity salience, attitudes, subjective norms, and behavioral intent), the perceived behavioral control items, and the manipulated variable self-categorization condition were specified based on the proposed theoretical model (see Figure 6).

Covariates were also introduced into the model by entering the measured covariates as predictors for all paths where they were expected to influence the outcome variable.

Covariates for attitudes toward prescription opioid use, identity salience, and behavioral intention to use prescription opioids were based on significant covariates in Study 1.

Covariates for perceived behavioral control over prescription opioid use and subjective norm about prescription opioids were selected based on the literature (Ajzen, 1985; O’Keefe, 2002; Pellino, 1998).

A comparison of fit indices for the final measurement model and the initial structural model was conducted. Mueller and Hancock (2019) recommend that the initial structural model be compared to the final measurement model that it is nested within using a χ^2 difference test to assess statistical difference between the two. Compared to the final measurement model, the initial structural model had significantly worse fit $\Delta\chi^2 = 2166.42$, $df = 345$, $p < .001$. However, difference in fit between a measurement model and a structural model is to be expected because “structural perfection is unlikely” (Mueller & Hancock, 2019, p. 453). In order to improve model fit I consulted the model modification indices and made 5 model modifications. The first model modification was to allow the attitude and subjective norms factors to covary. This is justifiable because attitudes and subjective norms are often significantly positively correlated (O’Keefe, 2002). The remaining four model modifications allowed the errors of each of the four measured perceived behavioral control items to covary, which is justifiable because of the similarities in content between the perceived behavioral control items. After making these changes, the final model fit was as follows (506, $N = 1181$) = 1907.722, $p < .001$; RMSEA = .054, CFI = .925, SRMR = .077. Based on Hu and Bentler’s (1999) recommendations for model fit regarding RMSEA and SRMR and Hair and colleagues’ (2010) .90 CFI recommendation, model fit was deemed acceptable and so the model was

retained as tenable and individual parameter estimates were interpreted. The proportion of explained variance (R^2) of all the endogenous variables can be found in Table 39, and both the standardized and unstandardized path coefficients can be found in Table 40. I now turn to hypothesis testing using standardized path coefficients.

Table 39

Proportion of Variance Explained in Endogenous Variables in the Final Structural

Model (N = 1181)

Factor	R^2
Identity Salience	.146
Attitudes	.206
Subjective Norms	.308
Perceived Behavioral Control_1	.066
Perceived Behavioral Control_2	.053
Perceived Behavioral Control_3	.026
Perceived Behavioral Control_4	.024
Behavioral Intent to Use Prescription Opioids	.662

Table 40

Unstandardized and Standardized Path Coefficients of the Final Structural Model (N =

1181)

Path	Path Coefficient Unstandardized	Path Coefficient Standardized
Predicting Identity Salience		
Significant Other Condition	0.825(.113)	0.252***
Human Being Condition	1.178(.107)	0.366***
Used Opioid	-0.867(.095)	-0.198***
Predicting Perceived Behavioral Control_1		
Identity Salience	0.134(.036)	0.129***
Prescribed Opioid	-0.331(.165)	-0.074**
Used Opioid	-0.566(.151)	-0.125***
Education	-0.038(.036)	-0.031
Race	0.163(.106)	0.043
Income	0.037(.016)	0.072**

Age	0.010(.004)	0.075**
Predicting Perceived Behavioral Control_2		
Identity Salience	-0.041(.038)	-0.033
Prescribed Opioid	0.864(.232)	0.164***
Used Opioid	0.005(.234)	0.001
Education	-0.118(.044)	-0.082**
Race	0.199(.128)	0.044
Income	0.050(.018)	0.082**
Age	0.005(.004)	0.035
Predicting Perceived Behavioral Control_3		
Identity Salience	0.132(.031)	0.141***
Prescribed Opioid	0.123(.155)	0.031
Used Opioid	-0.213(.151)	-0.052
Education	-0.018(.037)	-0.017
Race	0.042(.095)	0.012
Income	0.012(.015)	0.025
Age	0.006(.004)	0.069*
Predicting Perceived Behavioral Control_4		
Identity Salience	0.977(.478)	0.064**
Prescribed Opioid	3.317(2.46)	0.051
Used Opioid	-2.465 (2.47)	-0.037
Education	-1.281(.625)	-0.072
Race	1.047(1.78)	0.019
Income	0.728(.231)	0.095**
Age	0.163(.059)	0.085**
Predicting Attitudes		
Identity Salience	0.211(.031)	0.202***
Disabling Pain	-0.220(.100)	-0.055**
Current Addiction to Opioids	-0.088(.113)	-0.018
Education	0.136(.033)	0.111***
Painful Condition	0.068(.124)	0.020
Used Opioid	-1.405(.124)	-0.307***
Predicting Subjective Norms		
Identity Salience	-0.082(.012)	0.220***
Age	-0.001(.001)	-0.027
Education	0.057(.013)	0.131***
Race	-0.019(.032)	-0.014
Income	-0.007(.005)	-0.036
Family Drug Use	-0.028(.028)	-0.024
Used Opioid	-0.688(.075)	-0.423***
Predicting Behavioral Intent		
Attitudes	0.298(.056)	0.298***

Subjective Norms	1.534(.217)	0.545***
Perceived Behavioral Control1	0.104(.031)	0.103***
Perceived Behavioral Control2	0.030(.022)	0.035
Perceived Behavioral Control3	-0.039(.030)	-0.035
Perceived Behavioral Control4	-0.001(.002)	-0.021
Painful Condition	-0.091(.078)	-0.027

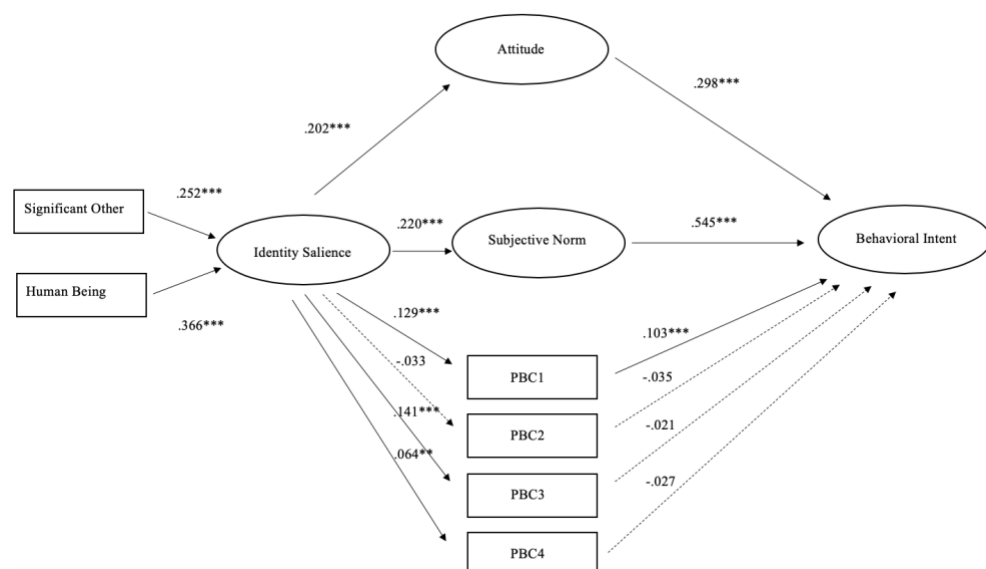
Note. For the unstandardized path coefficients standard errors are in parentheses. All

conditions were compared to the individual condition.

* $p \leq .10$, ** $p < .05$, *** $p \leq .001$.

Figure 9

Final Structural Model Predicting Behavioral Intent to Use Prescription Opioids



Note. Statistics are standardized coefficients from the final latent variable path analysis.

Dotted lines represent nonsignificant relations.

** $p < .05$. *** $p < .001$.

Identity saliency. Identity saliency was significantly predicted by self-categorization condition. Compared to the individual condition, being in the significant other and human being conditions resulted in significantly higher identity saliency (significant other, $\beta = .252$, $p < .001$; human, $\beta = .366$, $p < .001$). Having used

prescription opioids in the past also significantly negatively predicted identity salience, $\beta = -.198, p < .001$ such that identity salience was lower among those who had used prescription opioids in the past.

Attitude toward prescription opioid use. Attitude toward prescription opioid use was positively predicted by identity salience, $\beta = .202, p < .001$, such that those with high identity salience had more positive attitudes toward prescription opioid use (e.g., using prescription opioids is good, favorable, beneficial, etc.). Thus hypothesis 4 was supported. There were significant indirect effects of the experimental conditions such that being in the human condition or significant other condition significantly indirectly predicted more positive attitudes through identity salience than those in the individual condition (significant other, $\beta = .051, p < .001$; human being, $\beta = .074, p < .001$). In terms of covariates, being disabled by pain ($\beta = -.055, p = .027$) and having used prescription opioids in the past ($\beta = -.307, p < .001$) significantly predicted negative attitudes toward prescription opioids. Education ($\beta = .111, p < .001$) significantly positively predicted attitudes toward prescription opioids such that those with more years of education had more positive attitudes toward prescription opioids.

Subjective norm regarding prescription opioid use. Subjective norm regarding prescription opioid use was significantly positively predicted by identity salience, $\beta = .220, p < .001$, such that those with high identity salience perceived more positive subjective norms (greater approval) toward prescription opioid use. Thus hypothesis 5 was not supported. There were significant indirect effects such that being in the human condition or significant other condition significantly indirectly predicted more positive subjective norms through identity salience than those in the individual condition

(significant other, $\beta = .056, p < .001$; human being, $\beta = .081, p < .001$). In terms of covariates, education positively predicted subjective norm, $\beta = .131, p < .001$, and having used prescription opioids in the past negatively predicted subjective norm, $\beta = -.423, p < .001$.

Perceived behavioral control over prescription opioid use. Perceived behavioral control over prescription opioid use measure 1, “if I wanted to, I could choose to use prescription opioids” was positively predicted by identity salience, $\beta = .129, p < .001$. In terms of covariates, age positively predicted perceived behavioral control measure 1, $\beta = .075, p = .009$, income positively predicted perceived behavioral control measure 1, $\beta = .072, p = .022$, having used prescription opioids in the past negatively predicted perceived behavioral control measure 1, $\beta = -.125, p < .001$, and having been prescribed opioids in the past negatively predicted perceived behavioral control measure 1, $\beta = -.074, p = .044$. There were significant indirect effects of experimental condition such that being in the human condition or significant other condition significantly indirectly predicted greater perceived behavioral control measure 1 through identity salience than those in the individual condition (significant other, $\beta = .033, p = .001$; human being, $\beta = .047, p < .001$).

Perceived behavioral control over prescription opioid use measure 2 related to the possibility of choosing to use prescription opioids was not significantly predicted by identity salience, $\beta = -.033, p = .280$. In terms of covariates, income positively predicted perceived behavioral control measure 2, $\beta = .082, p = .004$, education negatively predicted perceived behavioral control measure 2, $\beta = -.082, p = .007$, and having been

prescribed opioids in the past positively predicted behavioral control measure 2, $\beta = .164$, $p < .001$. There were no significant indirect effects of experimental condition.

Perceived behavioral control over prescription opioid use measure 3, “it is mostly up to me whether or not I use prescription opioids,” was positively predicted by identity salience, $\beta = .141$, $p < .001$. In terms of covariates, age positively predicted perceived behavioral control, $\beta = .055$, $p = .069$, [95% CI = -0.00, .013]. There were significant indirect effects of experimental condition such that being in the human condition or significant other condition significantly indirectly predicted greater perceived behavioral control measure 3 through identity salience than those in the individual condition (significant other, $\beta = .036$, $p < .001$; human being, $\beta = .052$, $p < .001$).

Perceived behavioral control over prescription opioid use measure 4 related to how much control participants believe they have over using prescription opioids was positively predicted by identity salience, $\beta = .064$, $p = .041$. In terms of covariates, age and income positively predicted perceived behavioral control (age, $\beta = .085$, $p = .006$; income, $\beta = .095$, $p = .002$). There were significant indirect effects of experimental condition such that being in the human condition or significant other condition significantly indirectly predicted greater perceived behavioral control measure 4 through identity salience than those in the individual condition (significant other, $\beta = .016$, $p = .041$; human being, $\beta = .023$, $p = .039$).

Behavioral intention to use prescription opioids. Behavioral intent to use prescription opioids was significantly positively predicted by attitude, $\beta = .298$, $p < .001$, and significantly positively predicted by subjective norms, $\beta = .545$, $p < .001$. Behavioral intent was also significantly positively predicted by perceived behavioral control measure

1, $\beta = .103$, $p = .001$, but was not significantly predicted by perceived behavioral control measures 2, $\beta = .035$, $p = .166$; 3, $\beta = -.035$, $p = .199$; or 4, $\beta = -.021$, $p = .387$.

There were significant indirect effects such that being in the human condition or significant other condition significantly positively predicted behavioral intent through identity salience and subjective norm compared to those in the individual condition (significant other, $\beta = .030$, $p < .001$; human being, $\beta = .044$, $p < .001$). In other words, being in the significant other or human condition as compared to the individual condition increased identity salience which positively predicted acceptance of prescription opioid use (i.e., subjective norm), which in turn predicted increased behavioral intent to use prescription opioids.

The indirect effect of the human being and significant other condition through identity salience and attitudes on behavioral intent was significant (significant other, $\beta = .015$, $p < .001$; human being, $\beta = .022$, $p < .001$). In other words, being in the significant other or human condition as compared to the individual condition increased identity salience which predicted more positive attitudes toward prescription opioid use, which in turn predicted increased behavioral intent to use prescription opioids.

The indirect effect of the human being and significant other condition through identity salience and perceived behavioral control measure 1 on behavioral intent was significant (significant other, $\beta = .003$, $p = .018$; human being, $\beta = .005$, $p = .018$). In other words, being in the significant other or human condition as compared to the individual condition increased identity salience which predicted more perceived behavioral control over prescription opioid use, which in turn predicted increased behavioral intent to use prescription opioids. However, there was no significant indirect

effect of self-categorization condition on behavioral intent through identity salience and perceived behavioral control measure 2 (significant other, $\beta = -.000$, $p = .482$; human being, $\beta = -.000$, $p = .468$); measure 3 (significant other, $\beta = -.001$, $p = .258$; human being, $\beta = -.002$, $p = .250$); or measure 4 (significant other, $\beta = -.000$, $p = .476$; human being, $\beta = -.000$, $p = .468$).

Summary 5.4

In study 2, self-categorization was investigated as a message cue that influences attitude, subjective norms, perceived behavioral control, and intent to use prescription opioids through the mediating role of identity salience. As in pilot study 1 and study 1, participants considered prescription opioid use from a specific self-categorization. After conducting an EFA with an independent sample to ensure that the factor-variable relationship for the proximal determinants of health was not influenced by self-categorization, I conducted an experiment with three conditions. Participants were assigned to read a message about the pros and cons of prescription opioid use where self-categorization (i.e., individual, significant other, human being) was a manipulated message cue. I analyzed participants' responses to closed-ended questions using structural equation modeling to test hypotheses 4-6.

Attitude toward prescription opioid use was significantly positively predicted by identity salience. Specifically, those with high identity salience had more positive attitudes toward prescription opioid use. Furthermore, there were significant indirect effects such that self-categorizing as a human being or significant other predicted more positive attitudes toward prescription opioid use through identity salience compared to the individual condition. Thus hypothesis 4, which predicted that self-categorizing at

increasingly inclusive levels would predict more positive attitudes toward prescription opioid use was supported. Attitude significantly positively predicted behavioral intent to use prescription opioids such that those who reported more positive attitudes toward prescription opioid use reported greater intent to use prescription opioids. Attitude also played a mediating role such that self-categorizing as a significant other or human being resulted in greater identity salience which in turn predicted positive attitudes and increased intent to use prescription opioids.

Subjective norm was significantly predicted by identity salience, but not in the hypothesized direction. Identity salience positively predicted subjective norms such that those with high identity salience perceived more positive subjective norms (greater approval) toward prescription opioid use. Furthermore, there were significant indirect effects such that self-categorizing as a human being or significant other predicted more positive subjective norms (i.e., approval of prescription opioid use) through identity salience compared to the individual condition. Thus, hypothesis 5, which predicted that self-categorizing at increasingly inclusive levels predicts negative subjective norm, was not supported. Subjective norm significantly positively predicted behavioral intent to use prescription opioids such that those who reported that referent others would approve of prescription opioid use reported greater intent to use prescription opioids. Subjective norm also played a mediating role such that self-categorizing as a significant other or human being resulted in greater identity salience which in turn predicted positive subjective norm and increased intent to use prescription opioids.

Due to limitations in measurement, perceived behavioral control was modeled as four measured variables. Three of the four perceived behavioral control items were

significantly positively predicted by identity salience. In other words, as identity salience increased, perceived behavioral control over prescription opioid use increased. Furthermore, there were significant indirect effects such that self-categorizing as a human being or significant other predicted greater perceived behavioral control through identity salience compared to the individual condition. Thus, hypothesis 6, which predicted that self-categorizing at increasingly inclusive levels positively predicts perceived behavioral control over prescription opioid use, was supported. Only one perceived behavioral control measure (measure 1) significantly positively predicted behavioral intent to use prescription opioids such that those who reported more perceived behavioral control over prescription opioid use reported greater intent to use prescription opioids. Perceived behavioral control measure 1 also played a mediating role such that self-categorizing as a significant other or human being resulted in greater identity salience which in turn predicted greater perceived behavioral control and increased intent to use prescription opioids.

These findings, along with findings from pilot study 1 and study 1 are examined for patterns in data across studies and theoretical and practical implications in the following discussion chapter.

Chapter 6: Discussion

Integrating insights from self-categorization theory, construal level theory, and theory of planned behavior, this dissertation examined self-categorization as an intrinsic message feature that influences construal level to alter the proximal determinants of behavior: beliefs, attitudes, subjective norms, perceived behavioral control, and behavioral intent toward prescription opioid use. Construal level theory (CLT) has been adopted by communication researchers to understand how message cues that alter psychological distance change mental representations of a choice (e.g., Katz & Byrne, 2013), specifically choices about health behaviors (e.g., Ahn, 2015; Nan, 2007). Although CLT is receiving more attention from communication scholars, altering construal level through messaging remains elusive. In the field of social psychology where CLT originated, construal level is often manipulated through unwieldy priming procedures that require time and mental effort. Such time-consuming procedures are not practical for health professionals who have a limited amount of time available per patient visit in which they must accomplish several functions (Goold & Lipkin, 1999), nor implementable in communication campaign settings (Noar, 2006). Health communication messages created to manipulate construal level can also be problematic because they often change the characteristics of the choice despite the importance of accurate health information for health promotion (Kreps et al., 1998). Furthermore, previous research provides inconsistent evidence as to which message factors would prove most useful for health promotion. Specifically, the mechanisms of congruence and self-control offer differing advice for how to change construal level to benefit health behaviors (Katz & Byrne, 2013).

Recognizing these difficulties, I proposed self-categorization as an intrinsic message feature that may influence construal level in order to predict the proximal determinants of behavior noted above. Self-categorization is a useful perspective to provide message cues that influence construal level because self-categorization occurs in all interactions. In short, self-categorizing ourselves in relation to others helps us understand the social world (Oakes, 2003), reduces uncertainty (Hogg, 2001), and enhances the self (Reid & Hogg, 2005). Individuals also hold multiple cognitive representations of themselves (i.e., self-categorizations) that vary in level of abstraction, just as construals do (Turner, 1985). Which of these self-categorizations becomes salient in a given situation can be manipulated via relatively simple message features, including language (e.g., Brewer & Gardner, 1996). Furthermore, links between construal level and self-categorization have been uncovered: activating an abstract construal mindset induces the characteristics of categorization at the group level (McCrea et al., 2012) and increased temporal distance (a form of psychological distance associated with construal level) promotes high-level construal of the self (i.e., superordinate self-categorization; Wakslak et al., 2008).

In order to examine whether self-categorization influences construal level, I conducted four studies using several methods, including thought listing, questionnaires, and experimental design. I analyzed data thematically using an iterative approach and statistically using analysis of variance, exploratory and confirmatory factor analysis, and structural equation modeling. Study 1 examined U.S. adults' thoughts when they considered prescription opioid use from an individual, significant other, American, or human being self-categorization. Study 2 examined U.S. adults' attitudes, subjective

norms, and perceived behavioral control over prescription opioid use after reading a message that categorized them as an individual, significant other, or human being and described the pros (high-level construal) and cons (low-level construal) of prescription opioid use. Understanding how self-categorization influences beliefs and the proximal determinants of behavior is important if we consider self-categorization as a message cue that influences construal level and if we further recognize that altering construal level may change risk perceptions without changing message content (Ahn, 2015). In the following discussion, I unpack findings from pilot study 1, study 1, and study 2 regarding beliefs about prescription opioid use, dominance of belief type as an indicator of altered construal level, and differences in the proximal determinants of behavior resulting from varying self-categorization. I then weigh the evidence from all studies in this dissertation to suggest practical and theoretical implications before offering limitations of the dissertation and corresponding opportunities for future research.

6.1.1 Beliefs about Prescription Opioid Use

Before examining the influence of self-categorization on construal level in study 1, I conducted a pilot study. This study served two goals, first to determine what beliefs people hold about prescription opioid use in answer to the research question, and second, to determine what relational identities are meaningful to people in the context of prescription opioid use. To create effective message campaigns, communication scholars must first understand U.S. adults' beliefs about prescription opioid use. Health beliefs vary depending upon one's identity perspective (Haslam et al., 2009; Stanley et al., 2017; Stanley & Pitts, 2019). Therefore, I elicited beliefs from participants considering prescription opioid use from the relational identity they deemed most important to them:

parent of a child, relational partner of a significant other, relational partner of a friend, child of a parent. In a concurrent study, participants engaged in thought listing from an individual identity perspective. The beliefs participants listed were first coded deductively based on the theory of planned behavior and CLT as desirability or feasibility beliefs and then coded inductively to generate themes within each belief type. Findings revealed beliefs about prescription opioid use that were pervasive across identities but also beliefs about prescription opioid use that were unique to specific relational identities. These beliefs may inform future communication interventions that address the beliefs underlying the proximal determinants of behavior in order to change peoples' behaviors.

Attitudinal beliefs (i.e., valenced beliefs about the outcomes of a behavior) about prescription opioid use primarily focused on reasons not to use prescription opioids across relational and individual self-categorizations. Participants in pilot study 1 were overwhelmingly concerned about developing an addiction to prescription opioids. Concern about side effects (e.g., inability to drive, lack of energy, loss of emotion) and pain were the second and third most commonly mentioned attitudinal beliefs, respectively. Participants' beliefs about pain were unique in that pain was cited as a reason to initiate opioid use (get rid of pain) and as a reason not to initiate opioid use (may be more trouble than just dealing with pain). Participants cited additional reasons to use prescription opioids, including beliefs that prescription opioid use would help the participant physically and mentally.

Normative beliefs (i.e., beliefs about social pressure from referent others to perform or not to perform the behavior) in this study also primarily focused on reasons not to use prescription opioids but due to the influence of relational others. Crosscutting

concerns included the belief that using opioids was a stigmatized behavior and would result in a loss of acceptance by others in society (Goffman, 1963). Participants stated that they would trust their healthcare provider's advice about prescription opioid use. Participants who identified as "child of a parent" stated that they would trust their parent(s) to make decisions about initiating prescription opioid use. However, participants seemed to interpret "child of a parent" to mean that they should consider prescription opioid use from the perspective of someone under the age of 18. This interpretation did not align with our expectation that participants assigned to this condition would consider themselves as adult children making a choice about using prescription opioids intergenerationally in consultation with their adult parents. For this reason, child of a parent was not considered an appropriate relational self-categorization for study 1. Participants across relational identities expressed concerns about prescription opioid use negatively affecting their family members and, among those who identified as parents, their child and parenting abilities. In contrast to these concerns, however, some participants who identified as parents and significant others expressed beliefs that prescription opioid use may be beneficial if it allowed them to more fully participate in their relationships.

Feasibility beliefs (i.e., beliefs about barriers or facilitators to a behavior) were varied and not widely held across participants. The possibility of preventing children or others from accessing prescription opioids was a facilitating belief that allowed participants to more fully consider using prescription opioids. The possibility of taking opioids for a short period of time or at specific times of the day to avoid unwanted side effects was also a facilitating belief. Participants similarly described the idea of

“safeguards” from addiction (e.g., communicating with healthcare providers about the possibility of addiction; asking family members to monitor changes in their behavior) as facilitating their decision. Participants expressed a desire for opioid alternatives to manage their pain. However, there are significant barriers to the use of nonpharmacologic approaches to treating pain (Giannitrapani et al., 2018). Fear or anxiety about prescription opioid use was a concern across participants. Fear of prescription opioids may be protective if it prevents individuals from initiating prescription opioid use that leads to an opioid use disorder, but it may be harmful if it prevents individuals from initiating prescription opioid use that improves their functionality and quality of life.

Findings across the pilot study indicate tension between beliefs that prescription opioid use is beneficial, and that prescription opioid use is harmful. Participants believed that prescription opioid use might benefit them mentally and physically but were overwhelmingly concerned about addiction and fearful of using prescription opioids. Participants, especially those who self-identified as parents or significant others, believed that prescription opioid use may help them more fully participate in their relationships but expressed concern that prescription opioid use could result in stigmatization or negatively affect their children or relational partners. This duality speaks to the need for communication that addresses both the benefits and risks of prescription opioid use, especially because prescription opioid use can be appropriate and necessary for some but harmful for others (Dowell et al., 2016). This supports my insistence that any message about prescription opioid use include not only the risks of use but also the benefits. Communicating both risks and benefits is a core characteristic of risk communication. As

Fischhoff and colleagues (2011) note, risk communication must “deal with the benefits that risk decisions can produce...as well as the risks” (p. 1).

6.1.2 Beliefs about Prescription Opioid Use Indicative of Construal Level

Desirability/feasibility beliefs and pro/con beliefs are manifestations of construal level where pros and desirability beliefs represent high construal level and feasibility and con beliefs represent low construal level (Eyal et al., 2004; Trope et al., 2007). Pilot study 1 and study 1 revealed unexpected patterns in belief type generation across self-categorization. There was no statistically significant difference in desirability/feasibility dominance or pro/con dominance across self-categorizations. This contradicts what would be predicted by CLT. If self-categorization cues changes in construal level, we would expect participants who self-categorize at less inclusive levels to evince feasibility and con (low construal) belief dominance relative to desirability and pro (high construal) beliefs. Alternatively, we would expect participants who self-categorize at more inclusive levels to evince desirability and pro (high construal) belief dominance relative to feasibility and con (low construal) beliefs.

After investigating belief dominance measures, the average number of each belief type across relational and individual self-categorizations was compared. Analysis of variance tests for each belief type present a picture more in line with construal level theorizing. In pilot study 1, participants who self-categorized as significant others had significantly more desirability and normative beliefs than individuals, in study 1, participants in the human being condition listed more desirability beliefs than those in the American condition. This suggests that self-categorizing at a more inclusive level (i.e., relational as opposed to individual) results in the generation of more high construal

beliefs (i.e., desirability and normative beliefs). There was no significant difference in the amount of feasibility beliefs generated across self-categorizations. Differences in valenced beliefs somewhat echoed the findings of belief type as influenced by self-categorization. Con beliefs are considered low-level construals whereas pro beliefs are considered high-level construals (Eyal et al., 2004). Thus, we would expect that as the inclusivity of self-categorization increases, the number of pro beliefs elicited would increase and the number of con beliefs would decrease. However, in study 1 there was no significant difference in the number of cons listed across self-categorization conditions. There was, however, a significant difference in the number of pros listed such that those in the American condition listed fewer pros of prescription opioid use than those in the individual, significant other, and human being conditions.

6.1.3 Self-Categorization and Pro/Con Focus

In addition to examining belief generation as influenced by self-categorization, study 1 included closed-ended questions designed to measure the influence of specific feasibility and desirability beliefs generated in pilot study 1, as well as psychological distance and likelihood of using prescription opioids. While I initially expected the belief items to represent feasibility and desirability beliefs, exploratory factor analysis revealed two factors driving response variation that were best described as pro focus and con focus. I tested three models where self-categorization predicted likelihood of using prescription opioids through the mediating factors of identity salience, psychological distance, pro focus, and con focus. The best-fitting model revealed that self-categorization impacted pro focus through identity salience but did not directly nor indirectly influence con focus or psychological distance. Pro focus, con focus, and

psychological distance all significantly predicted likelihood of using prescription opioids, explaining 52% of the variance in likelihood of using prescription opioids. Specifically, con focus had a strong effect while pro focus and psychological distance had medium effects on likelihood of using prescription opioids (Acock, 2014).

Identity salience proved to be an important mediator of the relationship between self-categorization and construal level of a choice. Identity salience was conceptualized as a manipulation check in line with O’Keefe (2003) who argued that manipulation checks are unnecessary when using intrinsic message manipulations but may be treated as potentially mediating states. In this study, self-categorization condition served as an intrinsic message feature that affected the psychological outcome of identity salience, which ultimately affected construal level focus. Individual and American were the least salient identities and did not differ significantly from each other in terms of identity salience. See the practical implications section for various reasons why significant other and human being were more salient identities than individual or American.

Psychological distance is defined as a subjective, ego-centric perception of how near or far an event is from the self in the here and now (Trope & Liberman, 2010). However, Trope and Liberman (2010) suggest that this may be oversimplified because “some direct experiences may be more proximal than others” (p. 28). I argued that self-categorizations, while rooted in the self and thus direct experiences, may vary in the extent to which they are proximal to direct experience. However, in study 1, psychological distance was only marginally significantly directly and indirectly influenced by self-categorization. Notably, psychological distance has not been measured in CLT studies, only manipulated. Because I was unsure which if any of the

psychological distance dimensions self-categorization corresponded with, I chose to measure psychological distance. The psychological distance measure in study 1 included four items designed to correspond with the temporal, social, spatial, and hypothetical dimensions of psychological distance; the four dimensions of psychological distance currently theorized in CLT (Trope et al., 2007). Participants also pictorially rated the extent to which they and the issue of prescription opioid use overlap using a modified version of the inclusion of other in self scale (Gächter et al., 2015). This measure of psychological distance may be problematic because participants could vary in the extent to which they are psychologically distant on certain dimensions. Still, given the centrality of psychological distance in altering construal level, attempting to create a reliable and valid measure of psychological distance is a worthy goal that may aid the development of message cues that alter construal level by changing psychological distance.

Psychological distance was measured such that scores closer to 1 indicated greater psychological distance (farther from the issue of prescription opioid use) and larger scores indicated less psychological distance (closer to the issue of prescription opioid use). Psychological distance significantly predicted likelihood of using prescription opioids. As people perceive the issue of prescription opioid use as closer to themselves (i.e., psychologically close), likelihood of using decreases. This corresponds with theorizing that decreasing psychological distance increases the influence of low-construal beliefs (e.g., cons) and diminishes the influence of high-construal beliefs (e.g., pros) (Liberman & Trope, 1998). As with previous studies and theorizing, psychological distance and construal level (i.e., pro and con focus) are acting in harmony with each other on likelihood of using prescription opioids. Psychological distance corresponds

with construal level such that perceiving a choice to be closer cooccurs with greater generation of cons of engaging in that behavior (i.e., low level construal) and less generation of pros of engaging in that behavior (i.e., high level construal). The covariance among psychological distance and construal level was driven by self-categorization and identity salience. The changes in psychological distance and construal level ultimately influence behavior. In the case of a risky behavior like prescription opioid use, encouraging people to see a choice as psychologically close can increase the focus on the risks of that behavior. Ultimately, focusing on the cons of a behavior reduces likelihood of engaging in a behavior. Study 1 suggests that in communicating about risk behaviors, specifically prescription opioid use, message features that reduce psychological distance should be used.

Self-categorization at increasingly inclusive levels was not negatively associated with con focus, as would be predicted by CLT. Specifically, CLT posits that as psychological distance increases, high construal level beliefs (e.g., pros) should dominate while low construal level beliefs (e.g., cons) recede. In fact, con focus was not predicted by self-categorization nor identity salience. It may be that the dominant valence of public discussion nullified construal level and distance effects (Lutchyn & Yzer, 2011). As Lutchyn and Yzer (2011) note, well-rehearsed beliefs “may be simply triggered by the behavioral topic and not affected by changes in temporal perspective,” or in the case of this study, not affected by changes in self-categorization (p. 604). The highly publicized discussion around prescription opioid use and the predominant focus on negative aspects of prescription opioid use (Dasgupta et al., 2009) may explain the lack of association of con focus with self-categorization condition and identity salience.

On the other hand, self-categorization at more inclusive levels positively predicted pro focus indirectly through identity salience for those in the significant other and human being condition as compared to the individual condition. This is consistent with CLT in that as a choice is seen as psychologically further away, more high-level construal beliefs (i.e., pro focus) will be generated. The influence of self-categorization on pro focus also may speak to the lack of public discussion around the benefits of prescription opioid use. Because the discourse surrounding prescription opioid use is largely con focused and therefore cons are highly salient, con focus was not influenced by self-categorization condition. However, discourse surrounding prescription opioid use rarely focuses on pros of prescription opioid use and therefore pro focus was susceptible to changes cued by self-categorization.

In previous research, encouraging participants to construe health choices at high levels has resulted in health promotive outcomes (e.g., Lutchyn & Yzer, 2011; Nan, 2009). This dissertation demonstrates, however, that whether high- or low-level construal of a choice is health promotive depends upon the characteristics of the choice as communicated in the message. The variable value of high- or low-level construals has been acknowledged in theory (Trope & Liberman, 2000). However, in research, high level construals are typically presumed to result in more positive outcomes. This is in part due to the social psychological perspective that high construal level results in greater self-control (Fujita et al., 2006; Trope et al., 2007) and in part because most research using CLT has focused on health promotive or otherwise positive behaviors (e.g., Fujita et al., 2006; Nan, 2009). In the case of a risky behavior, like prescription opioid use, increasing construal level is not health promotive because it increases focus on the benefits of

engaging in the risky behavior. I further explain the implications of this finding for risk communication in the practical implications section.

6.1.4 Self-Categorization as a Message Cue Influencing Behavioral Intent

The purpose of study 2 was to manipulate self-categorization to determine whether the effects seen in study 1 continue to hold even when people are presented with the same set of context attributes (i.e., pros and cons) that represent high and low construal level beliefs in a message. Communicating not only the possibility for benefits of short-term prescription opioid use but also the risks is ethically required to allow potential prescription opioid users to make informed decisions, but message characteristics that simultaneously reduce the demand for opioids while offering complete information about its benefits would be most useful and ethical. Whether self-categorization directs focus to either the pros or cons listed in the message will be evident in participants' attitudes, subjective norms, perceived behavioral control, and behavioral intent to use prescription opioids, all of which are proximal predictors of behavior specified in the theory of planned behavior.

Attitude is defined as the degree to which a person has a favorable or unfavorable evaluation toward performing a behavior (i.e., using prescription opioids). I predicted that self-categorizing at increasingly inclusive levels would predict more positive attitudes toward prescription opioid use. I reasoned that if self-categorization influences construal level, then as self-categorization becomes more inclusive (e.g., moving from individual to group member), participants will have more high-level construal beliefs (e.g., pros) and fewer low-level construal beliefs (e.g., cons). This reasoning was supported by the data. Attitude was positively predicted by identity salience and there were significant indirect

effects such that self-categorizing as a human being or significant other predicted more positive attitudes through identity salience compared to the individual condition.

Attitudes are based on the evaluation of beliefs about the consequences of an action. Taken together, the results of studies 1 and 2 suggest that altering self-categorization facilitates belief-based attitude change (O'Keefe, 2002). Generally, as self-categorization became more inclusive in study 1, people generated more desirability beliefs. Furthermore, analysis of closed-ended responses in study 1 indicated that self-categorizing as a human being or significant other positively predicted pro focus as compared to the individual condition. Thus, across studies and methods used, it appears that self-categorizing at more inclusive levels (i.e., human being and significant other compared to individual) results in more positive attitudes toward and greater focus on the pros of prescription opioid use. Pro focus and positive attitudes also positively predicted likelihood to use prescription opioids and behavioral intent to use prescription opioids, respectively. I further explain the implications of this finding for health communication scholars in the practical implications section.

Subjective norms are determined by normative beliefs, which focus on the likelihood that referent others approve or disapprove of performing a given behavior (Ajzen, 1985). I hypothesized that self-categorizing at increasingly inclusive levels would predict negative subjective norm, but this was not supported by the data. I reasoned that if self-categorization influences construal level, then as self-categorization becomes more inclusive, subjective norms would be based on group norms regarding prescription opioids rather than idiosyncratic beliefs about individual referents. I further reasoned that group-based subjective norms would be negative because of the negative media coverage

of prescription opioid use (Dasgupta et al., 2009) and the rhetoric surrounding prescription opioid use (e.g., “national public health emergency”; Christie et al., 2017, p. 5). While subjective norm was significantly predicted by self-categorization condition, there was a positive relationship such that self-categorization at increasingly inclusive levels predicted positive subjective norm. In retrospect, study 1’s results should have alerted me to the possibility that the subjective norms of those self-categorizing at the superordinate or relational level would be positive because in study 1 those self-categorizations positively predicted pro focus as compared to individual condition. Furthermore, subjective norms are often positively associated with attitudes, which I predicted would become more positive as inclusivity of self-categorization increased.

Self-categorization may have altered the subjective norm either by adding a new referent or changing the salience of an existing referent (O’Keefe, 2002). For example, those in the individual self-categorization may have relied on a larger range of referents who have used prescription opioids to form their subjective norms. Those in the significant other condition may have largely focused on their significant other’s evaluation of prescription opioid use and those in the human being condition may have relied on abstract referents to guide their subjective norms. Categorizing as a significant other or human being were both more salient than categorizing as an individual, and thus based on theorizing, we would expect that participants in those conditions were responding in ways they felt aligned with group norms (Terry et al., 1999). Thus the indirect influence of self-categorization on behavioral intent through identity salience and subjective norms does align with theorizing that subjective norms are group-level constructs that should influence behavioral intention more when the message recipient is

considering the behavior from the perspective of group-membership (Terry & Hogg, 1996; Terry et al., 1999).

Subjective norms also strongly positively predicted intent to use prescription opioids in study 2. The relative strength of subjective norms as a predictor of intent to use prescription opioids aligns with previous research in the context of prescription opioid use where clients' and counselors' willingness to use certain prescription medications (e.g., methadone, buprenorphine) to treat opiate dependence in drug treatment programs primarily depended on their perceived social norms regarding the use of prescription medications (Rieckmann et al., 2007). Ultimately, self-categorizing as a significant other or human being is associated with more accepting subjective norms than self-categorizing as an individual. Subjective norms positively predict behavioral intent. Therefore, to generate negative subjective norms and reduce intent to use prescription opioids, individual should be the self-categorization used in messaging in this context.

Perceived behavioral control is the perceived ease or difficulty of performing the behavior. I predicted that self-categorizing at increasingly inclusive levels positively predicts perceived behavioral control over prescription opioid use. This prediction was supported by the data. Three of the four perceived behavioral control items were significantly positively predicted by identity salience and there were significant indirect effects as well, such that self-categorizing as a human being or significant other predicted greater perceived behavioral control through identity salience compared to the individual condition. These findings align with research from the field of social psychology demonstrating that self-categorizing at more inclusive levels results in greater personal control (Greenaway et al., 2015) and self-control (Fujita et al., 2006). However, only one

perceived behavioral control item (i.e., if I wanted to, I could choose to use prescription opioids) positively predicted behavioral intent to use prescription opioids. That perceived behavioral control generally did not predict behavioral intention also aligns with theorizing and previous research that found perceived behavioral control is an individual-level construct that influences behavioral intention more when the message recipient is considering the behavior from the perspective of a unique individual (Terry & Hogg, 1996; Terry et al., 1999). Thus, while self-categorizing at more inclusive levels increases perceived behavioral control, perceived behavioral control is less predictive of behavioral intent when people are self-categorizing more inclusively than at the individual level. In the theoretical implications section, I examine why only one perceived behavioral control item predicted behavioral intent. In the practical implications section, I examine what the lack of influence of perceived behavioral control on behavioral intent to use prescription opioids means for practitioners.

6.2 Practical Implications

The final structural model in study 2 found that manipulating self-categorization in a message about prescription opioid use results in changes to attitudes, perceived behavioral control, subjective norms, and behavioral intent through the mediating role of identity salience. The indirect influence of self-categorization message cues on these proximal determinants of behavior suggests the utility of self-categorization message cues lies in their influence on construal level. Recall that in study 1 self-categorization influenced pro focus (an indicator of construal level) through identity salience such that as identity salience increased, pro focus increased. Study 2 not only replicates the finding of study 1 that self-categorization influences construal level focus and behavioral intent

through identity salience but also supports the findings of study 1 that more inclusive levels of self-categorization are associated with higher construal level beliefs (i.e., pros of use, positive attitudes, positive subjective norms, greater perceived behavioral control) through the mediating role of identity salience. Taken in tandem with the results of study 1, we may tentatively conclude that altering self-categorization as a message cue is a feasible way to change one's construal of a choice and ultimately behavioral intent without changing the characteristics of a choice. However, altering construal level to be high or low is not a worthy goal in itself. The effects of altering construal level are highly context dependent. Ultimately, in the context of prescription opioid use, health communication practitioners should communicate the risks and benefits of prescription opioid use at the subordinate level of self-categorization (i.e., unique individual) to reduce intent to use prescription opioids.

Whether altering construal level of a behavior benefits health depends upon the characteristics of the behavior as communicated to message recipients. In the context of health promotive behaviors (e.g., eating fruits and vegetables, using public transit, being tested for hepatitis C), health communication practitioners should draw attention to high construal characteristics. Drawing focus to high construal characteristics of health promotive behaviors has resulted in increased perceived risk of not engaging in the behavior (Nan, 2007), increased perceived benefits from engaging in the behavior (Nan, 2007), and more favorable issue judgment (Nan, 2007). Alternatively, in the context of risk behaviors (e.g., daily consumption of sugar-sweetened beverages, prescription opioid use), health communication practitioners should draw attention to low construal characteristics. Drawing focus to low construal characteristics of health risk behaviors

has resulted in reduced intentions to engage in the behavior (Ahn, 2015). In this dissertation, altering self-categorization to be less inclusive (i.e., individual self-categorization) cued fewer high construal beliefs (i.e., fewer positive attitudes, less social approval of the behavior, less pro focus), resulting in lower behavioral intent and likelihood of using prescription opioids. Ultimately, in the context of prescription opioid use, messages should not encourage people to self-categorize at more inclusive levels (i.e., human being, significant other) because doing so results in a greater pro focus on, more positive attitudes toward, and more positive subjective norms regarding prescription opioid use. Instead, messaging about prescription opioid use should address people as unique individuals because comparatively, that results in less intent to use prescription opioids.

In studies 1 and 2, self-categorization served as an intrinsic message feature that affected the psychological outcome of identity salience, which ultimately affected construal level. Identity salience refers to the degree to which an identity is the “basis for perception and self-conception” in a given situation (Hogg & Reid, 2006, p. 18). Both studies demonstrated that more inclusive identities (i.e., human being and significant other) were more salient than the least inclusive identity, unique individual. Participants may have been motivated by identity protection to avoid thinking about themselves (i.e., individual identity salience) in the context of opioids, which may cultivate threats to one’s self-concept (Hepper et al., 2010). Alternatively, relational identities have proven to be influential in health contexts such as smoking (Stanley & Pitts, 2019) and HPV vaccination (Stanley et al., 2017). This study provides further evidence that relational identities are particularly salient self-categorizations that may be tapped in health

communication to motivate certain health-related behaviors. The high identity salience of human being was surprising given that optimal distinctiveness theory suggests that individuals will prefer intermediate categorizations that allow for some distinctiveness over superordinate categorizations that may be too inclusive (Leonardelli et al., 2010). In contrast, the intermediate self-categorization of American used in study 1 was the least salient identity and seemed to have unique properties compared to other self-categorizations. There are several reasons why this may have been the case. Participants may have been motivated to distance themselves from an American identity because of the discursive environment linking Americans to opioids through the repeated use of the term “national epidemic” (Dasgupta et al., 2009; Gostin et al., 2017). Alternatively, the self-categorization of “American” may be less accessible or perceived as not fitting the situation of prescription opioid use decisions (Hogg & Reid, 2006). Whatever the case may be, choosing highly salient self-categorizations is necessary when using self-categorization as a message cue to influence construal level.

In examining perceived behavioral control, this dissertation speaks to the extent to which using prescription opioids is a volitional behavior. In study 2, only perceived behavioral control item 1, which stated that “if I wanted to, I could choose to use prescription opioids” significantly predicted behavioral intention to use prescription opioids. This item speaks to the controllability rather than the difficulty of using prescription opioids (Ajzen, 2002). This finding indicates that people who perceive prescription opioid use as a controllable behavior have greater behavioral intent to use prescription opioids. Still, the overall influence of perceived behavioral control on behavioral intent was relatively small. This finding echoes a study of adults undergoing

elective orthopedic surgery, where perceived behavioral control was not related to intention to use pain medication (Pellino, 1998). Perceived behavioral is based on control beliefs about the presence or absence of needed resources and opportunities (O’Keefe, 2002). Like control beliefs, feasibility beliefs are concerned with how to engage in a behavior, including facilitators and barriers to action. Findings from the pilot study and study 1 also spoke to the lack of influence of beliefs about the ability to engage in POU. Feasibility beliefs did not differ across self-categorization and participants elicited fewer feasibility beliefs compared to desirability beliefs in study 1. The pilot study showed that what feasibility beliefs existed were primarily focused on fear of using prescription opioids and largely idiosyncratic. The feasibility beliefs that spoke to facilitators of prescription opioid use largely focused on controllability of the behavior, for example, locking opioids to prevent diversion, safeguards to avoid addiction, and nighttime use to be alert. Taken together, evidence from this dissertation suggests that people perceive prescription opioids to be relatively easy to obtain but harder to control after initiating use. To reduce prescription opioid use, messages might focus on the lack of control (i.e., craving) that patients with chronic pain have experienced when using prescription opioids (Wasan et al., 2012) or the characteristics of addiction that include “impaired control over drug use, compulsive use, continued use despite harm, and craving” (Sehgal et al., 2012, p. 68). Interventions may also focus on system-wide interventions to reduce the extent to which prescription opioid use is seen as an easily performed behavior, for example, monitoring inpatient opioid prescribing patterns (Kim et al., 2017), reducing the number of opioids per prescription, or distributing opioid prescriptions in blister packs.

6.3 Theoretical Implications

The central proposition of CLT is that psychological distance from a choice is a major determinant of how a person will mentally represent the choice in their minds and subsequently what characteristics will be used to evaluate it (Trope et al., 2007). A choice is considered psychologically distant to some extent “whenever it is not part of one’s direct experience” (Trope et al., 2007, p. 84). Previous CLT research has largely altered temporal distance to alter construal level (e.g., Eyal et al., 2000; Fujita et al., 2008), though other psychological distance dimensions such as social distance (Ahn, 2015; Nan, 2007) and spatial distance (Wakslak & Trope, 2008) have been used. If we consider self-categorization as tethering self-concept in relation to others, just as social distance (e.g., self vs. other, in-group vs. outgroup) creates psychological distance in relation to others, we might consider self-categorization as a form of social distance. Particularly in light of Trope and Liberman’s (2010) suggestion that the current definition of psychological distance may be oversimplified because “some direct experiences may be more proximal than others” (p. 28). However, self-categorization is focused on mental representations of the self and thus a part of one’s direct experience, though some self-categorizations (i.e., human being, significant other) were found to be more salient than others (i.e., individual, American) in the context of prescription opioid use. Perhaps self-categorization should not be considered a psychological distance dimension but rather a message cue. Especially given that psychological distance was not significantly predicted by self-categorization in study 1. Katz and Byrne (2013) theorize that there are three types of cues that may be present in a message and alter construal level: distance cues, motivation cues, and abstraction cues. A distance cue is essentially how psychological distance

dimensions (e.g., temporal distance) are made evident to the message recipient (e.g., imagine using prescription opioids ten years from now). A motivation cue is related to self-control, for example focusing on the benefits or loss of benefits that will occur by engaging or failing to engage in a behavior. Finally, abstraction cues are images or language, for example the extent to which a message is descriptive or vague, that result in concrete or abstract thinking. Of these three message cues, I believe that self-categorization is most likely operating as an abstraction cue.

Self-categorization is a message cue where more inclusive levels of self-categorization are more abstract than others (Turner, 1985). Thus, by including self-categorization in a message, people are encouraged to think in the level of abstraction elicited by the message cue. Self-categorization as an abstraction cue has practical benefits as well. Unlike other abstraction cues that require changing the level of detail provided in a message, something that could be contrary to message guidelines such as those put forth by the clear communication index etc. (Baur & Prue, 2014), using self-categorization as an abstraction cue allows messages to stay the same while only altering how the recipient is addressed. Ultimately, this dissertation suggests that altering self-categorization, whether it acts as a message cue or a psychological distance dimension, alters construal level of a choice.

That self-categorizing at more inclusive levels led to higher level construals (i.e., desirability beliefs, pro focus, positive attitudes, positive subjective norms) and ultimately increased intent to use prescription opioids speaks to the congruence or self-control debate. The mechanisms of congruence and self-control offer differing advice for how to change construal level to benefit health (Katz & Byrne, 2013). Priming high

construal mindsets should increase self-control (Fujita et al., 2006; Greenaway et al., 2015) and invoke a desire to align one's behavior with one's ideal self (Trope et al., 2007). On the other hand, low construal message features that are congruent with the near psychological distance at which many health choices are considered should result in greater processing fluency and thus greater persuasion (Katz & Byrne, 2013; Kim et al., 2009). Thus, it is unclear whether messages should focus on generating self-control via high construal message features or congruence via low construal message features in order to promote health. While not directly measuring self-control or processing fluency, this study can still shed light on the debate.

Higher construal level was primed in this study by altering self-categorization and this did result in greater perceived behavioral control. However, the only perceived behavioral control item that significantly predicted behavioral intent positively predicted behavioral intent. Perceived behavioral control is defined as the perceived ease or difficulty of performing the behavior. Self-control is defined as "acting in line with one's primary, central objective" (Trope et al., 2007, p. 13). The differences between these two definitions speaks to the need for formative research in specific message contexts. While people may believe that they can act to meet their primary goal (i.e., self-control) and that they can easily perform the behavior required to meet their goal (i.e., perceived behavioral control) this does not necessarily mean their behavior will be health promotive. We cannot assume that people's primary goals align with the goals of researchers and health practitioners. Instead we must determine what people's primary goals are. If their primary goals are health promotive (i.e., avoid taking prescription opioids and instead use nonpharmacologic pain management), then engendering higher

construal level through more inclusive self-categorizations will be health promotive. If people's primary goals put them in line for some health risk (i.e., do whatever it takes to reduce pain), then engendering higher construal level that increases self-control and perceived behavioral control will not be health promotive. Thus, the social psychological argument that increasing self-control is a beneficial outcome in and of itself does not translate to the health communication context where people's primary goals do not necessarily always align with the goals that health care practitioners would wish for them. In short, people do not always behave in ways that are health promotive due to a variety of factors, including structural constraints, beliefs, attitudes, and values, which ultimately creates the need for communication focused on health promotion (Kreps et al., 1998).

On the other hand, the premise of the congruence argument is that construal features embedded in a message that construct choices in either abstract or concrete ways may interact with psychological distance to enhance processing fluency and increase message effectiveness. People typically encounter health choices at low psychological distances (e.g., I must make the decision now, for myself), which means that low-level construals (e.g., feasibility concerns, cons) are more fluently and automatically processed thus lending them more weight in decision-making (Kim et al., 2009). High-level construals (e.g., desirability concerns, pros) are less fluently and automatically processed thus diminishing their weight in decision making. In this dissertation, people were asked to consider using prescription opioids. Some were currently using opioids or had used opioids in the past. Some may have been truly weighing whether they should or should not use opioids. These differences in hypotheticality as a psychological distance dimension may have interacted with the temporal and social psychological distance

dimensions that participants were asked to consider opioid use from (i.e., consider prescription opioid use now, for yourself as either an individual, significant other, or human being). Notably, most decisions that people are asked to make in construal level research are hypothetical rather than concrete. Thus, most CLT research manipulates not only time or social distance (the two most commonly manipulated distance dimensions) but also hypotheticality. For example, Liberman and Trope (1998) asked participants to “imagine that a guest lecture on decision processes in organizations” would be given tomorrow or a year from now (p. 9). The conflation of the purposefully manipulated distance dimension (i.e., time) and hypotheticality is a problem across the CLT literature that is difficult to address using existing research designs. Regardless, those in the individual condition did focus more on low-level construals compared to those in the significant other and human being conditions. There does appear to be some sort of congruence effect occurring where high construal level beliefs are weighted more heavily as more inclusive self-categorizations are used in decision making and low construal level beliefs are weighted more heavily as less inclusive self-categorizations are used in decision-making.

Prescription opioid use is a challenging behavior to address because its outcomes are ambiguous: people may experience benefits from prescription opioid use, but they may also experience negative outcomes. This complexity drew me to the topic of prescription opioid use and, while demanding, examining such a context has illuminated several issues that require further theorizing and research. First, this dissertation highlights the nuanced distinctions between belief type (i.e., desirability/feasibility) and belief valence (i.e., pro/con). CLT applied to persuasive contexts began by examining

desirability and feasibility beliefs as demonstrative of high and low-level construals where the value of each construal type varies depending upon psychological distance (e.g., Liberman & Trope, 1998). Desirability beliefs refer to reasons why or why not a person would engage in a behavior whereas feasibility beliefs refer to barriers and facilitators of a behavior. There is no valence specified in these definitions yet much CLT research has implied a valence such that desirability beliefs refer primarily to reasons why (i.e., positive) people engage in a behavior and feasibility beliefs refer primarily to barriers (i.e., negative) to engaging in a behavior (e.g., Lutchyn & Yzer, 2011). Eyal et al. (2004) began the study of pros and cons as indicative of construal level. Both pros/cons and desirability/feasibility beliefs are theorized as primary and secondary features that are differentially weighted depending upon psychological distance (Trope et al., 2007). This is explained by the property of asymmetric conditional importance, which suggests that feasibility beliefs and cons are secondarily considered compared to desirability beliefs and pros (Eyal et al., 2004). Specifically, arguments regarding why an individual would engage in a future action (i.e., desirability beliefs) are higher level construals than arguments regarding how to take future action (i.e., feasibility beliefs) because feasibility is typically only considered if the desire to engage in the behavior is sufficient. This same reasoning hold for pro and con beliefs: reasons against engaging in the behavior will be considered only if the reasons for engaging in the behavior are sufficient. Thus, feasibility beliefs are subordinate to desirability beliefs; con beliefs are subordinate to desirability beliefs (Eyal et al., 2004).

However, pros and cons are by their nature valenced. Equating pro beliefs with desirability beliefs or feasibility beliefs with con beliefs oversimplifies construal level

and can be misleading. For example, participants who engaged in thought listing in study 1 listed more desirability beliefs than feasibility beliefs across self-categorization conditions. On its face, this would indicate that as self-categorization increases, construal level increases. However, those desirability beliefs were primarily negative (i.e., cons). When an EFA was conducted on belief items and items largely separated in terms of pro or con beliefs, pro focus was higher as self-categorization increased, again suggesting that as self-categorization increased, construal level increased. While the influence of self-categorization on desirability beliefs and pros seems to therefore align the two as interchangeable, that does not tell the whole story. Other research has found different effects of psychological distance on desirability/feasibility beliefs and pro/con beliefs. In Lutchyn and Yzer's (2011) research, time frame did not affect the ratio of pros/cons generated for each behavior, but it did affect the ratio of feasibility/desirability beliefs generated for each behavior. In the context in which they investigated (e.g., eating fruits and vegetables), they interpreted this finding to indicate that the valence of beliefs (pros/cons) may be less influenced by psychological distance compared to belief type (desirability/feasibility). However, in the context of prescription opioid use, the valence of beliefs seems to be more influenced by psychological distance compared to belief type.

Second, this dissertation speaks to the difficulty of addressing addictive substances in existing risk communication and persuasion frameworks. As noted earlier, determining whether a belief spoke to feasibility or desirability concerns was difficult. The possibility for addiction could be considered a desirability concern—a reason why one would choose not to use prescription opioids. On the other hand, the possibility of addiction could be considered a barrier to use that affects how one uses prescription

opioids, in other words, a feasibility concern. The possibility to experience stigma as a result of prescription opioid use could operate in the same way: Is it a reason not to use prescription opioids or a barrier that makes prescription opioid use difficult? Having attempted to parse out beliefs as feasibility or desirability concerns (and further categorize desirability beliefs as normative or attitudinal beliefs) I found categorizing beliefs about prescription opioids in terms of pros and cons to be far simpler and more intuitive. However, relatively little research has been conducted on the use of pros and cons in messaging compared to feasibility and desirability beliefs. Feasibility and desirability beliefs align with the beliefs underlying the proximal predictors of health as specified in TPB (e.g., feasibility beliefs as predictive of perceived behavioral control) but pros and cons do not necessarily tell us the type of belief influenced but only the valence of beliefs.

Gain and loss framing may speak to the influence of pro and con beliefs on behaviors, indeed gain-loss framing research has found the context of health behavior to be similarly influential in terms of the effects of gain-loss framing. Gain-framed messages significantly positively predict health promotive behaviors (e.g., skin cancer prevention, smoking cessation, physical activity) whereas loss framing marginally but not significantly predicts detection behaviors (Gallagher & Updegraff, 2012). Detection behaviors have been theorized as being more risky than prevention behaviors (Rothman & Salovey, 1997). Still, despite much research on gain and loss-frame messages, the psychological processes underlying a frame's persuasive effect have been difficult to identify (Rothman & Updegraff, 2010). Ultimately, more research examining belief valence in the context of addictive substances rather than belief type would be useful.

Prescription opioid use is a particularly challenging addictive substance because it has clinical benefits whereas many addictive substances (e.g., nicotine products, alcohol) do not have clinical benefits. However, examining such nuanced topics is needed as substances like Marijuana, CBD, e-cigarettes, and Kratom are being examined for potential clinical health benefits and legalization, but also forefronting concerns of misuse and abuse (McCance-Katz, 2019). How do health communicators create messages that help people make beneficial health decisions while acknowledging the complexity of such a decision?

6.4 Limitations and Directions for Future Research

The studies in this dissertation are not without limitations and findings should be evaluated within the limitations of these studies. The findings of the pilot study and study 1 are limited by the small sample size drawn from a non-probability sample. While there are concerns about MTurk workers as “permanent participants” (Chandler et al., 2014), evidence suggests that MTurk workers are more diverse than other populations on which research is typically conducted (Paolacci et al., 2010). Still, there were likely significant differences in age, gender, income, and level of education in participants in this study compared to a random sample of U.S. adults (Paolacci et al., 2010). In terms of characteristics relevant to opioid use, MTurk workers tend to be younger and more educated than the general US population, predominantly Caucasian, and middle class (Paolacci et al., 2010; Shapiro et al., 2013). These differences may have influenced beliefs about prescription opioid use. For example, adults aged 18-49 had lower prevalence of prescription opioid use than older adults and non-hispanic whites have the highest rates of prescription opioid when examined by race/ethnicity (Han et al., 2017).

Furthermore, approximately 50% of MTurk workers reported clinically significant social anxiety symptoms and substantial number of MTurk workers screened positive for potential substance abuse problems (Shapiro et al., 2013), both of which correlate with non-medical use of prescription opioids (Becker et al., 2008). Future research should examine the beliefs of a larger more diverse sample of adults. Purposive sampling to elicit the beliefs of current prescription opioid users, their family and friends, and opioid prescribers may be especially useful in uncovering beliefs unique to each population that can be addressed in segmented communication interventions. Furthermore, while I tried to screen out bots in Study 1 based on answers to open-ended questions that do not make sense or included phrases that appear verbatim online when searched via Google as recommended in the literature (Chmielewski & Kucker, 2020), I may have missed some bots. In future, researchers using MTurk should include more stringent precautions to ensure data from bots is not included in studies by including Captcha, as I did in study 2.

This study is also limited in that participants' responses to the survey were unable to be probed to ensure understanding or dig deeper into their responses. Research utilizing qualitative methods such as interviews or focus groups may be usefully employed to address this shortcoming and provide a more nuanced understanding of U.S. adults' beliefs about initiating prescription opioid use, particularly as it relates to identity concerns. This would be especially useful because of the difficulty of categorizing participants' responses as feasibility or desirability beliefs. As stated earlier, in the context of addictive substances, the line between desirability and feasibility beliefs is blurred. Are concerns about addiction concerns about how one would take a prescription opioid or concerns about why one would or would not take a prescription opioid?

Furthermore, the data were coded by only one person, which is problematic because the process of coding and categorizing was not duplicated, thus calling the reproducibility of findings into question (Krippendorff, 2004). The lack of documented reliability of coding findings may explain the contradictory findings regarding self-categorization's influence on construal level depending upon whether the method of thought listing and ANOVA was used to analyze data or whether closed-ended questions and structural equation modeling were used to analyze data. In future research, open-ended thought listing responses should be coded by at least two independent coders to ensure reliability of coding.

Study 1 elicited the beliefs of adults asked to consider initiating prescription opioid use from the following self-categorizations: individual, significant other, American, or human being. Study 2 assessed the attitudes, subjective norms, perceived behavioral control, and behavioral intent of adults asked to consider initiating prescription opioid use from individual, significant other, or human being. While the self-categorization conditions tested in this study are frequently used in self-categorization research and are relevant to prescription opioid use, there are other self-categorizations that may have been more salient in the context of prescription opioid use. For example, chronic pain sufferer, of which 30.7% of U.S. adults self-identified in 2010 (Johannes et al., 2010), or veteran, many of whom experience chronic pain in addition to post traumatic stress disorder and other severe injuries (Gauntlett-Gilbert & Wilson, 2013). American in particular was problematic as a group identity. A different group identity that was less implicated in the issue of prescription opioid use may have been more

appropriate. Participants may also have been assigned to conditions that were not relevant to them, though this likely would have been captured in the identity salience measure.

The findings of this dissertation are limited to the context of prescription opioid use in the United States. Participants were required to be located in the United States. I imposed this restriction because I reasoned that adults living in the US would likely have unique beliefs about prescription opioid use relative to adults living in other countries where prescription opioid use is not a health concern of national importance (Christie et al., 2017; Rudd et al., 2016a). Despite warnings that prescription opioid use may become a global concern (Humphreys, 2017), evidence suggests that prescription opioid use is already internationally widespread (United Nations Office on Drugs and Crime, 2017). Still, North America (i.e., the US and Canada) bears the most burden from opioid use-related harm (Nolan et al., 2018), which likely influences the effect of self-categorization on construal of prescription opioid use.

Finally, the findings of study 2 are limited in that the message participants read did not address pros or cons related to relational concerns because of the possibility that these pros and cons would be uniquely aligned with the relational self-categorization. Future research might examine whether relationally-focused pros and cons of a behavior influence construal level across self-categorizations or only when message recipients self-categorize at the relational level. Self-categorizing at increasingly inclusive levels influences construal level. Perhaps other cues that put people in a relational or otherwise socially inclusive frame of mind would also influence construal level of a message. The study 2 message also focused only on proximal potential outcomes of prescription opioid use (e.g.,) rather than more distal outcomes of prescription opioid use (e.g., addiction,

withdrawal) in order to avoid adding a time dimension to the message. However, research has shown the importance of temporal framing (Nan et al., 2015) and it may be useful to examine the influence of more distal outcomes on construal level of a choice.

6.5 Conclusion

In this dissertation, I investigated how the benefits and risks of prescription opioid use may be communicated in a way to reduce intent to use prescription opioids. To accomplish this goal, I turned to self-categorization theory, construal level theory, and the theory of planned behavior. Through several studies, I provided foundational evidence of U.S. adults' beliefs regarding prescription opioid use from different identity perspectives. Modeling showed the influence of self-categorization on construal level and proximal determinants of behavior occur through identity salience. Self-categorizing at more inclusive levels (i.e., significant other, human being) as compared to less inclusive levels (i.e., individual) resulted in more desirability beliefs and more pro beliefs regarding prescription opioid use. Self-categorizing at more inclusive levels (i.e., significant other, human being) also resulted in more positive attitudes toward, more accepting subjective norms regarding, and greater perceived behavioral control over prescription opioid use. Across studies, results suggest the utility of altering self-categorization to alter construal level. However, in the context of communicating a risk behavior (i.e., prescription opioid use), less inclusive self-categorizations that induce low-construal beliefs should be used to reduce uptake of the risk behavior.

Although with limitations, this dissertation contributes to theory and practice on construal level, specifically altering construal level in messages. From a construal level perspective, this dissertation suggests that more theorizing regarding construals beyond

feasibility and desirability beliefs and the differential effects of construal level in health promotion and risk communication must be addressed. From a self-categorization perspective, this dissertation demonstrates the utility of self-categorization as an intrinsic message feature that changes mental representations of a choice. From a theory of planned behavior perspective, this dissertation demonstrates the importance of recognizing which identities are relevant to a given behavior because self-categorization meaningfully influences the proximal predictors of behavior. Overall, my dissertation shows the utility of self-categorization as an intrinsic message feature that influences construal level, which ultimately affects the proximal predictors of behavior as specified in the theory of planned behavior. It makes important contributions to understandings of health messaging in one particularly complicated context, prescription opioid use, and suggests ways of reducing intent to use prescription opioids using communication cues.

Appendix A

Human Intelligence Tasks

Human Intelligence Task (Pilot Study and Study 1)

Title: List your thoughts on prescription opioid use

Description: List your thoughts on prescription opioid use for \$1.00! Takes approximately 10 minutes.

Keywords: survey, thought listing

HIT info

Reward per assignment: \$1

Number of assignments per HIT: 20

Time allotted per assignment: 2 hours

HIT expires in: 7 days

Auto-approve and pay workers in: 3 days

Worker Requirements

Require that workers be masters: no

Additional qualifications: HIT approval rate of at least 95%. Location is the United States.

Design Layout

Earn \$1.00 by letting us know your thoughts about prescription opioid use. You will read instructions and then complete a thought-listing task and a brief set of questions. Takes less than 10 minutes.

Select the link below to complete the survey. At the end of the survey, you will be asked to enter your MTurk ID and will receive a randomly generated code to paste into the box below to receive credit for taking our survey. **Make sure to leave this window open as you complete the survey.** When you are finished, you will return to this page to paste the code into the box.

Human Intelligence Task (Study 2)

Title: Read and Respond to a Message about Prescription Opioids

Description: Read and respond to a message about prescription opioid use for \$1.00!
Takes approximately 10 minutes.

Keywords: survey, message testing

HIT info

Reward per assignment: \$1

Number of assignments per HIT: 20

Time allotted per assignment: 2 hours

HIT expires in: 7 days

Auto-approve and pay workers in: 3 days

Worker Requirements

Require that workers be masters: no

Additional qualifications: HIT approval rate of at least 95%. Location is the United States.

Design Layout

Earn \$1.00 by reading and responding to a message about prescription opioid use. You will read the message and then complete several sets of questions. Takes less than 10 minutes.

Select the link below to complete the survey. At the end of the survey, you will be asked to enter your MTurk ID and will receive a randomly generated code to paste into the box below to receive credit for taking our survey. **Make sure to leave this window open as you complete the survey.** When you are finished, you will return to this page to paste the code into the box.

Appendix B

Consent Forms

Consent to Participate (Pilot Study and Study 1)

Project Title	List your thoughts on prescription opioid use
Purpose of the Study	This research is being conducted by Samantha Stanley and Anita Atwell Seate at the University of Maryland, College Park. We are inviting you to participate in this research project because you are living in the United States and are 18 years or older. The purpose of this research project is to understand U.S. adults' thoughts about initiating prescription opioid use.
Procedures	<p>For this study you will complete an online survey. First, you will be asked to imagine your life from a specific perspective. Immediately after reading the passage, you will be asked to write down your thoughts about starting prescription opioid use. Finally, you will answer several questions. Example survey questions include:</p> <ul style="list-style-type: none"> ● “Have you ever been or do you think you might currently be addicted to prescription pain medications?” ● “Please list all the thoughts that come to your mind about when thinking about starting to use prescription opioids” <p>After completing all items in the survey, you will receive \$1.00 via the Amazon MechanicalTurk online system for completing no more than 10 minutes of research.</p>
Potential Risks and Discomforts	There are no known risks from participating in this study.

Potential Benefits	There are no direct benefits from participating in this research. We hope that, in the future, other people might benefit from this study through improved understanding of thoughts that people have about beginning prescription opioid use.
Confidentiality	<p>The surveys are anonymous and will not contain information that may personally identify you. Any potential loss of confidentiality will be minimized by storing data in a password protected online file accessible only to the researchers.</p> <p>If we write a report or article about this research project, your identity will be protected to the maximum extent possible. Your information may be shared with representatives of the University of Maryland, College Park or governmental authorities if you or someone else is in danger or if we are required to do so by law.</p>
Compensation	You will receive \$1.00 for completing all items in the survey. You will be responsible for any taxes assessed on the compensation.
Right to Withdraw and Questions	<p>Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.</p> <p>If you decide to stop taking part in the study, if you have questions, concerns, or complaints, or if you need to report an injury related to the research, please contact the investigator:</p> <p style="text-align: center;">Samantha Stanley Department of Communication 2130 Skinner Building University of Maryland College Park, MD 20742-7635 sjstan@umd.edu 605-376-2609</p>
Participant Rights	If you have questions about your rights as a research participant or wish to report a research-related injury,

	<p style="text-align: center;">please contact:</p> <p style="text-align: center;">University of Maryland College Park Institutional Review Board Office 1204 Marie Mount Hall College Park, Maryland, 20742 E-mail: irb@umd.edu Telephone: 301-405-0678</p> <p style="text-align: center;">For more information regarding participant rights, please visit: https://research.umd.edu/irb-research-participants</p> <p>This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.</p>
Statement of Consent	<p>By clicking on the button below you indicate that you are at least 18 years of age; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction and you voluntarily agree to participate in this research study. Please feel free to print out a copy of this consent form for your records. If you agree to participate, click on the button below. I have read the above information.</p> <p><input type="radio"/> I agree to participate in this study</p> <p><input type="radio"/> I decline participation in this study</p>

Consent to Participate (Study 2)

Project Title	Prescription Opioid Message Testing
Purpose of the Study	This research is being conducted by Samantha Stanley and Anita Atwell Seate at the University of Maryland, College Park. We are inviting you to participate in this research project because you are 18 years or older. The purpose of this research project is to understand adults' responses to a message about using prescription.
Procedures	<p>For this study you will complete an online survey. First, you will read a message about prescription opioids. Immediately after reading the passage, you will answer several questions. Example survey questions include:</p> <ul style="list-style-type: none"> • “The people in my life whose opinions I value would approve of my using prescription opioids”

	<ul style="list-style-type: none"> • “If I wanted to, I could choose to use prescription opioids” <p>After completing the survey, you will receive \$1.00 via the Amazon MechanicalTurk online system for completing no more than 10 minutes of research.</p>
Potential Risks and Discomforts	There are no known risks from participating in this study.
Potential Benefits	There are no direct benefits from participating in this research. We hope that, in the future, other people might benefit from this study through improved understanding of people’s responses to messages about prescription opioids.
Confidentiality	<p>The surveys are anonymous and will not contain information that may personally identify you. Any potential loss of confidentiality will be minimized by storing data in a password protected online file accessible only to the researchers.</p> <p>If we write a report or article about this research project, your identity will be protected to the maximum extent possible. Your information may be shared with representatives of the University of Maryland, College Park or governmental authorities if you or someone else is in danger or if we are required to do so by law.</p>
Compensation	You will receive \$1.00 if you answer all questions. You will be responsible for any taxes assessed on the compensation.
Right to Withdraw and Questions	<p>Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.</p> <p>If you decide to stop taking part in the study, if you have questions, concerns, or complaints, or if you need to report an injury related to the research, please contact the investigator:</p>

	<p style="text-align: center;">Samantha Stanley Department of Communication 2130 Skinner Building University of Maryland College Park, MD 20742-7635 sjstan@umd.edu 605-376-2609</p>
Participant Rights	<p>If you have questions about your rights as a research participant or wish to report a research-related injury, please contact:</p> <p style="text-align: center;">University of Maryland College Park Institutional Review Board Office 1204 Marie Mount Hall College Park, Maryland, 20742 E-mail: irb@umd.edu Telephone: 301-405-0678</p> <p>For more information regarding participant rights, please visit: https://research.umd.edu/irb-research-participants</p> <p>This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.</p>
Statement of Consent	<p>By clicking on the button below you indicate that you are at least 18 years of age; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction and you voluntarily agree to participate in this research study. Please feel free to print out a copy of this consent form for your records.</p> <p>If you agree to participate, click on the button below.</p> <p>I have read the above information.</p> <p><input type="radio"/> I agree to participate in this study</p> <p><input type="radio"/> I decline to participate in this study</p>

Appendix C

Experience of Pain and Risk for Problematic Opioid Use Questions

In the past 30 days, have you been prescribed an opioid? Prescription opioids include codeine, fentanyl, hydrocodone, hydromorphone, meperidine, methadone, morphine, and oxycodone. Brand names of these prescription opioids include Actiq, Duragesic, Fentora, Lazanda, Lorta, Vicodin, Norco, Lorcet, Dilaudid, Demerol, Methadose, Roxicodone, Percocet, and Oxycontin. Over-the-counter pain relievers such as Aspirin, Tylenol, Advil, or Aleve are not considered prescription opioids.

- Yes, I have been prescribed an opioid in the past 30 days
- No, I have not been prescribed an opioid in the past 30 days

In the past 30 days, have you used a prescription opioid, regardless of whether it was prescribed to you?

- Yes, I have used a prescription opioid in the past 30 days
- No, I have not used a prescription opioid in the past 30 days

Do you have one or more painful condition(s)?

- Yes
- No

Are you unable to work or participate fully in activities because of pain?

- Yes
- No

Has anyone in your immediate family (father, mother, siblings) ever had a problem with chronic pain?

- Yes
- No

Has anyone in your immediate family (father, mother, siblings) ever had a problem with drugs or alcohol?

- Yes
- No

Have you ever been or do you think you might currently be addicted to prescription pain medications?

- Yes
- No

Appendix D

Demographic Questions

What is your age in years?_____

What is your sex?

- Male
- Female
- Intersex
- Other_____

What is the highest level of school you have completed or the highest degree you have received?

- Less than high school degree
- High school graduate (high school diploma or equivalent including GED)
- Some college but no degree
- Associate degree in college (2-year)
- Bachelor's degree in college (4-year)
- Master's degree
- Doctoral degree
- Professional degree (JD, MD)

Choose one or more races that you consider yourself to be:

White

Asian

Black or African American

Hispanic/Latinx

American Indian or Alaska Native

Native Hawaiian or Pacific Islander

Other_____

Please indicate the answer that includes your entire household income in (previous year) before taxes.

- Less than \$10,000
- \$10,000 to \$19,999
- \$20,000 to \$29,999
- \$30,000 to \$39,999
- \$40,000 to \$49,999
- \$50,000 to \$59,999
- \$60,000 to \$69,999
- \$70,000 to \$79,999
- \$80,000 to \$89,999
- \$90,000 to \$99,999
- \$100,000 to \$149,999

- \$150,000 or more

Appendix E

Instruments Used in Pilot Study

Relational Identity Relevance

1. Please select which of the following relationships is most meaningful to you:
 - Child of a parent
 - Relational partner to a significant other
 - Parent of a child
 - None of these relationships are relevant to me

Thought-Listing

2. Think of yourself as the child of your parent (relational partner of your significant other/parent to your child/unique individual). As the child of your parent (relational partner/parent/unique individual), you are experiencing long-term pain. Think of your life together, what is it like? Please list your thoughts.

3. Please list all the thoughts that come to your mind about when thinking about starting to use prescription opioids as a (relational partner, parent, child, unique individual)

Identity Salience

While listing my thoughts...

1. I was thinking about being a (parent/ relational partner /child/unique individual).
2. I evaluated myself positively or negatively in terms of (being a parent/ relational partner /child/unique individual).
3. I thought (being a parent/ relational partner /child/unique individual) was central to my identity.
4. I was unaware of (being a parent/ relational partner /child/unique individual).
5. I thought (being a parent/ relational partner/child/unique individual) was important.
6. I thought (being a parent/spouse/child/unique individual) came into play.

Appendix F

Instruments Used in Study 1

Thought Listing

1. Think of yourself as (a unique individual/significant other/an American/human being). As (a unique individual/significant other/an American/human being) you are experiencing long-term pain. Think of your life, what is it like? Please list your thoughts.
2. Please list all the thoughts that come to your mind when thinking about starting to use prescription opioids as (a unique individual/significant other/an American/human being).

Identity Salience

While listing my thoughts...

1. I was thinking about being (a unique individual/significant other/an American/human being).
2. I evaluated myself positively or negatively in terms of being (a unique individual/significant other/an American/human being).
3. I thought being (a unique individual/significant other/an American/human being) was central to my identity.
4. I was unaware of a being (a unique individual/significant other/an American/human being).
5. I thought being (a unique individual/significant other/an American/human being) was important.
6. I thought being (a unique individual/significant other/an American/human being) came into play.

Influence of Feasibility Beliefs

As (a unique individual/significant other/an American/human being) to what extent would ...

1. fear of using opioids influence your ability to start using prescription opioids?
2. inability to handle pain without prescription opioids influence your ability to start using prescription opioids?
3. nervousness about using opioids influence your ability to start using prescription opioids?
4. the ability to prevent others (e.g., children, family members) from accessing your prescription opioids influence your ability to start using prescription opioids?
5. the existence or lack of alternative pain relief methods influence your ability to start using prescription opioids?
6. the financial cost of prescription opioids influence your ability to start using prescription opioids?
7. the possibility of altering prescription opioid use to avoid side effects influence your ability to start using prescription opioids?
8. the possibility of safeguards to avoid opioid addiction influence your ability to start using prescription opioids?

9. the possibility of using opioids only for a short period time influence your ability to start using prescription opioids?
10. your healthcare provider's willingness to prescribe opioids influence your ability to start using prescription opioids?

Influence of Attitudinal Beliefs

As (a unique individual/significant other/an American/human being) to what extent does...

1. concern about addiction influence whether or not you would start using prescription opioids?
2. concern about fentanyl influence whether or not you would start using prescription opioids
3. concern about people stealing prescription opioids influence whether or not you would start using prescription opioids?
4. concern about side effects influence whether or not you would start using prescription opioids?
5. the possibility for opioids to help you physically influence whether or not you would start using prescription opioids?
6. the possibility of relieving pain influence whether or not you would start using prescription opioids?

Influence of Normative Beliefs

As (a unique individual/significant other/an American/human being) to what extent does...

1. concern that addiction may harm your relationships influence whether or not you would start using prescription opioids?
2. stigma attached to opioid use influence whether or not you would start using prescription opioids?
3. the possibility that opioid use may burden your partner influence whether or not you would start using prescription opioids?
4. the possibility that opioid use may harm your ability to parent influence whether or not you would start using prescription opioids?
5. the possibility that opioid use may hurt your relationships influence whether or not you would start using prescription opioids?
6. the possibility that opioid use may improve your relationships influence whether or not you would start using prescription opioids?
7. trust in other relational partners influence whether or not you would start using prescription opioids?
8. trust in your healthcare provider influence whether or not you would start using prescription opioids?

Influence of Feasibility and Desirability Beliefs

As (a unique individual/significant other/an American/human being) ...

1. how likely is it that you could begin using prescription opioids? (0-100)
2. how desirable is starting to use prescription opioids? (0-100)
3. how likely is it that you would start to use prescription opioids? (0-100)

Appendix G

Instruments Used in Study 2

Identity Salience

While listing my thoughts...

1. I was thinking about being (a unique individual/significant other /human being).
2. I evaluated myself positively or negatively in terms of being (a unique individual/significant other/ human being).
3. I thought being (a unique individual/significant other/ human being) was central to my identity.
4. I was unaware of a being (a unique individual/significant other/ human being).
5. I thought being (a unique individual/significant other/ human being) was important.
6. I thought being (a unique individual/significant other/ human being) came into play.

Attitudes

In your view as a unique individual/significant other/human being, using prescription opioids is:

1. Bad: Good
2. Unfavorable: Favorable
3. Negative: Positive
4. Undesirable: Desirable
5. Unnecessary: Necessary
6. Harmful: Beneficial

Perceived Behavioral Control

As a unique individual significant other/human being...

1. If I wanted to, I could choose to use prescription opioids.
2. For me to choose to use prescription opioids is Possible: Impossible
3. It is mostly up to me whether or not I use prescription opioids.
4. How much control do you believe you have over using opioids? 0-100

Subjective Norms

1. Most people who are important to me think I should NOT use prescription opioids.
2. The people in my life whose opinions I value would approve of my using prescription opioids.
3. Most people who are important to me use prescription opioids.
4. The people whose opinions I value use prescription opioids.
5. The people whose opinions I value would disapprove of my using prescription opioids.

1. My significant other thinks I should NOT use prescription opioids.
2. My significant other would approve of my using prescription opioids.
3. My significant other uses prescription opioids.
4. My significant other would disapprove of my using prescription opioids.
5. The people whose opinions I value use prescription opioids.

1. Most human beings think I should NOT use prescription opioids.
2. Most human beings would approve of my using prescription opioids.
3. Most human beings use prescription opioids.
4. Most human beings would disapprove of my using prescription opioids.
5. The people whose opinions I value use prescription opioids.

Behavioral Intent

As a unique individual significant other/human being...

1. I intend to use prescription opioids when I feel pain.
2. I will try NOT to use prescription opioids when I feel pain.
3. I plan to use prescription opioids when I experience pain.
4. How likely is it that you would use prescription opioids? 0-100

Appendix H

Accuracy Affirmation, Thanks, and MTurk Code

Accuracy Affirmation

Realistically, I know some MTurk respondents do not pay close attention to the questions they are answering. This affects the quality of my data. Please select one of the following honestly. Your answer is confidential. It will not affect whether or not you receive payment and will not affect any rating given to you for your work. Did you pay attention and answer honestly?

- Yes, keep my data.
- No, delete my data.

Thanks and code

Thank you for participating in this study.

If you have any questions or concerns about this study, please contact the Principal Investigator, Samantha Stanley at sjstan@umd.edu.

Please enter your MTurk ID.

Please paste the code below into the MTurk interface.

`#{e://Field/Random%20ID}`

Please press the continue button >> one more time.

Appendix I

Data Screening and EFA of Attitudes Toward Prescription Opioid Use for Study 2

Table I1

Means, Standard Deviations, Skewness, and Kurtosis of Attitude Items

Item	<i>M (SD)</i>	Skewness	Kurtosis
In your view as a unique individual, using prescription opioids is: Bad; Good	2.96(1.84)	.639	-.423
In your view as a unique individual, using prescription opioids is: Unfavorable; Favorable	2.78(1.78)	.831	.024
In your view as a unique individual, using prescription opioids is: Negative; Positive	3.04(1.80)	.493	-.476
In your view as a unique individual, using prescription opioids is: Undesirable; Desirable	2.86(1.83)	.798	-.061
In your view as a unique individual, using prescription opioids is: Unnecessary; Necessary	3.51(1.96)	.321	-.721
In your view as a unique individual, using prescription opioids is: Harmful; Beneficial	2.95(1.83)	.637	-.366
In your view as a significant other, using prescription opioids is: Bad; Good	2.98(1.82)	.626	-.456
In your view as a significant other, using prescription opioids is: Unfavorable; Favorable	2.81(1.69)	.597	-.547
In your view as a significant other, using prescription opioids is: Negative; Positive	2.80(1.65)	.621	-.268
In your view as a significant other, using prescription opioids is: Undesirable; Desirable	2.87(1.79)	.630	-.586
In your view as a significant other, using prescription opioids is: Unnecessary; Necessary	3.40(1.87)	.227	-.899
In your view as a significant other, using prescription opioids is: Harmful; Beneficial	2.91(1.76)	.484	-.861
In your view as a human being, using prescription opioids is: Bad; Good	3.13(1.88)	.629	-.196

In your view as a human being, using prescription opioids is: Unfavorable; Favorable	2.79(1.71)	.658	-.316
In your view as a human being, using prescription opioids is: Negative; Positive	2.96(1.72)	.459	-.516
Item	<i>M (SD)</i>	Skewness	Kurtosis
In your view as a human being, using prescription opioids is: Undesirable; Desirable	2.71(1.82)	.870	.015
In your view as a human being, using prescription opioids is: Unnecessary; Necessary	3.49(1.90)	.142	-.957
In your view as a human being, using prescription opioids is: Harmful; Beneficial	3.03(1.80)	.306	-1.12

Table I2

Pattern/Structure Coefficients and Communalities based on an Exploratory Factor

Analysis for Attitude Items

Item	Pattern/Structure Coefficients	Communality
In your view as a unique individual, using prescription opioids is: Bad; Good	.865	.754
In your view as a unique individual, using prescription opioids is: Unfavorable; Favorable	.856	.888
In your view as a unique individual, using prescription opioids is: Negative; Positive	.858	.795
In your view as a unique individual, using prescription opioids is: Undesirable; Desirable	.771	.768
In your view as a unique individual, using prescription opioids is: Unnecessary; Necessary	.741	.549

In your view as a unique individual, using prescription opioids is: Harmful; Beneficial	.858	.740
In your view as a significant other, using prescription opioids is: Bad; Good	.893	.863
In your view as a significant other, using prescription opioids is: Unfavorable; Favorable	.885	.800
In your view as a significant other, using prescription opioids is: Negative; Positive	.891	.831
In your view as a significant other, using prescription opioids is: Undesirable; Desirable	.780	.611
In your view as a significant other, using prescription opioids is: Unnecessary; Necessary	.742	.689
In your view as a significant other, using prescription opioids is: Harmful; Beneficial	.863	.812
In your view as a human being, using prescription opioids is: Bad; Good	.797	.636
In your view as a human being, using prescription opioids is: Unfavorable; Favorable	.865	.755
In your view as a human being, using prescription opioids is: Negative; Positive	.866	.754

Item	Pattern/Structure Coefficients	Communality
In your view as a human being, using prescription opioids is: Undesirable; Desirable	.773	.612
In your view as a human being, using prescription opioids is: Unnecessary; Necessary	.749	.607
In your view as a human being, using prescription opioids is: Harmful; Beneficial	.861	.758

Appendix J

Data Screening and EFA of Subjective Norms Regarding Prescription Opioid Use

Study 2

Table J1

Means, Standard Deviations, Skewness, and Kurtosis of Subjective Norm Items

Item	<i>M (SD)</i>	Skewness	Kurtosis
Most human beings think I should <u>NOT</u> use prescription opioids.	5.27(1.40)	.678	-.120
Most people who are important to me think I should <u>NOT</u> use prescription opioids.	5.49(1.62)	.914	.026
My significant other thinks I should <u>NOT</u> use prescription opioids.	5.16(1.46)	.461	-.353
The people in my life whose opinions I value would approve of my using prescription opioids.	2.84(1.76)	-.565	-.743
My significant other would approve of my using prescription opioids.	3.09(1.64)	-.338	-.760
Most human beings would approve of my using prescription opioids.	3.33(1.75)	-.296	-.997
Most people who are important to me use prescription opioids.	2.21(1.52)	-1.23	.739
Most human beings use prescription opioids.	3.32(1.44)	-.560	-.890
My significant other uses prescription opioids.	2.39(1.44)	-.560	-.890
The people whose opinions I value use prescription opioids.	2.50(1.65)	-.784	-.482

Table J2

Pattern/Structure Coefficients and Communalities based on an Exploratory Factor

Analysis for Subjective Norm Items

Item	Pattern/Structure Coefficients	Communality
Most human beings think I should <u>NOT</u> use prescription opioids.	-.625	.390
Most people who are important to me think I should <u>NOT</u> use prescription opioids.	-.694	.481
My significant other thinks I should <u>NOT</u> use prescription opioids.	-.645	.416
The people in my life whose opinions I value would approve of my using prescription opioids.	.821	.674
My significant other would approve of my using prescription opioids.	.794	.630
Most human beings would approve of my using prescription opioids.	.795	.631
Most people who are important to me use prescription opioids.	.686	.470
Most human beings use prescription opioids.	.567	.322
My significant other uses prescription opioids.	.649	.410
The people whose opinions I value use prescription opioids.	.756	.571

Appendix K

Data Screening and EFA of Perceived Behavioral Control Over Prescription Opioid

Use Study 2

Table K1

Means, Standard Deviations, Skewness, and Kurtosis of Perceived Behavioral Control

Items

Item	<i>M (SD)</i>	Skewness	Kurtosis
As a unique individual, if I wanted to, I could choose to use prescription opioids.	4.64(1.78)	.646	-.540
As a human being if I wanted to, I could choose to use prescription opioids.	4.80(1.73)	.713	-.388
As a significant other, if I wanted to, I could choose to use prescription opioids.	4.39(1.82)	.479	-.774
As a unique individual, for me to choose to use prescription opioids is...Possible; Impossible	4.21(2.03)	-.172	-1.24
As a significant other, for me to choose to use prescription opioids is...Possible; Impossible	4.34(1.90)	-.317	-1.02
As a human being, for me to choose to use prescription opioids is...Possible; Impossible	4.04(1.82)	-.051	-.977
As a human being, it is mostly up to me whether or not I use prescription opioids.	5.34(1.28)	1.06	.962
As a significant other, it is mostly up to me whether or not I use prescription opioids.	5.52(1.44)	.851	.115
As a unique individual, it is mostly up to me whether or not I use prescription opioids.	5.47(1.39)	1.05	1.02
As a unique individual, how much control do you believe you have over using opioids?	75.94(30.27)	-1.19	.161
As a significant other, how much control do you believe you have over using opioids?	70.93(32.87)	-.897	-.578

As a human being, how much control do you believe you have over using opioids? 77.78(28.50) -1.30 .586

Note. Participants rated “how much control do you believe you have over using prescription opioids” on a 100-mm graphical rating scale with the anchors *no control* and *complete control*.

Table K2

Pattern Loadings and Communalities based on an Exploratory Factor Analysis for Perceived Behavioral Control Items

Item	Factor 1	Factor 2	Communality
As a unique individual, if I wanted to, I could choose to use prescription opioids.	.532	-.295	.423
As a human being if I wanted to, I could choose to use prescription opioids.	.569	-.253	.436
As a significant other, if I wanted to, I could choose to use prescription opioids.	.660	-.103	.469
As a unique individual, for me to choose to use prescription opioids is...Possible; Impossible	.837	.142	.681
As a significant other, for me to choose to use prescription opioids is...Possible; Impossible	.792	.243	.622
As a human being, for me to choose to use prescription opioids is...Possible; Impossible	.784	.056	.604
As a human being, it is mostly up to me whether or not I use prescription opioids.	.001	-.635	.403
As a significant other, it is mostly up to me whether or not I use prescription opioids.	-.044	-.596	.348
As a unique individual, it is mostly up to me whether or not I use prescription opioids.	.128	-.459	.247
As a unique individual, how much control do you believe you have over using opioids?	.038	.788	.612

As a significant other, how much control do you believe you have over using opioids?	.016	.786	.614
As a human being, how much control do you believe you have over using opioids?	.055	.777	.593

Appendix L

Data Screening and EFA of Behavioral Intent to Use Prescription Opioids Study 2

Table L1

Means, Standard Deviations, Skewness, and Kurtosis of Behavioral Intent Items

Item	<i>M (SD)</i>	Skewness	Kurtosis
As a human being, I intend to use prescription opioids when I feel pain.	4.98(1.73)	-.438	-1.13
As a significant other, I intend to use prescription opioids when I feel pain.	5.13(1.70)	-.630	-.784
As a unique individual, I intend to use prescription opioids when I experience pain.	5.10(1.67)	-.401	-1.10
As a unique individual, I will try <u>NOT</u> to use prescription opioids when I feel pain.	2.52(1.50)	.902	.121
As a human being, I will try <u>NOT</u> to use prescription opioids when I feel pain.	2.39(1.53)	1.06	.195
As a significant other, I will try <u>NOT</u> to use prescription opioids when I feel pain.	2.55(1.64)	.961	-.057
As a unique individual, I plan to use prescription opioids when I experience pain.	5.00(1.73)	-.327	-1.30
As a significant other, I plan to use prescription opioids when I experience pain.	5.02(1.67)	-.322	-1.16
As a human being, I plan to use prescription opioids when I experience pain.	4.93(1.72)	-.341	-1.12
As a human being, how likely is it that you would use prescription opioids?	23.44(25.23)	1.15	.667
As a unique individual, how likely is it that you would use prescription opioids?	23.01(26.80)	1.21	.568
As a significant other, how likely is it that you would use prescription opioids?	22.38(28.52)	1.32	.671

Note. Participants rated the probability of starting prescription opioid use (i.e., “how likely is it that you would use prescription opioids”) on a 100-mm graphical rating scale with the anchors *extremely low* and *extremely high*.

Table L2

Pattern/Structure Coefficients and Communalities based on an Exploratory Factor

Analysis for Behavioral Intent Items

Item	Pattern/Structure Coefficients	Communality
As a human being, I intend to use prescription opioids when I feel pain.	.887	.787
As a significant other, I intend to use prescription opioids when I feel pain.	.862	.742
As a unique individual, I intend to use prescription opioids when I experience pain.	.895	.800
As a unique individual, I will try <u>NOT</u> to use prescription opioids when I feel pain.	-.758	.575
As a human being, I will try <u>NOT</u> to use prescription opioids when I feel pain.	-.745	.555
As a significant other, I will try <u>NOT</u> to use prescription opioids when I feel pain.	-.740	.548
As a unique individual, I plan to use prescription opioids when I experience pain.	.910	.829
As a significant other, I plan to use prescription opioids when I experience pain.	.853	.727
As a human being, I plan to use prescription opioids when I experience pain.	.909	.826
As a human being, how likely is it that you would use prescription opioids?	-.689	.475
As a unique individual, how likely is it that you would use prescription opioids?	-.697	.486

As a significant other, how likely is it that you would use prescription opioids?	-0.619	.383
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