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CAPITALIZING ON CHANGE: HABITUS TRANSFORMATION AND CANCER
MITIGATION IN THE FIELD OF FIREFIGHTING *

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Abstract

While cancer remains the leading cause of occupational death among firefighters, cancer mitigation efforts are not always successful. This study examines how health practices become durable behavioral changes within the professional field of California firefighters. Drawing on 48 in-depth interviews, we examine how health uptake has been successful in a field where resistance would be expected based on entrenched tradition and masculine culture. Integrating Bourdieu's framework with Fundamental Cause Theory, we show that cultural, symbolic, and social capital must be reconfigured concurrently to transform the entrenched habitus and enhance cancer mitigation. Specifically, acquiring new knowledge on cancer risks, reclassifying clean gear as a new symbol of professionalism, and solidifying the new knowledge and symbol through cohesive social networks can facilitate habitus transformation and produce sustained behavioral changes in cancer mitigation. Our research enriches both theoretical perspectives and extends medical sociology's understanding of how to overcome sociocultural barriers to pro-health actions.

Keywords: Bourdieu, cancer mitigation, fundamental cause theory, firefighter, health intervention, professional field

Highlights

- Sociocultural factors can form key barriers to health uptake in a professional field.
- Various types of capital can be reconfigured to enhance health practices.
- Cancer mitigation requires aligned cultural, symbolic, and social capital.
- Habitus transformation is crucial to durable health behavior change.
- Top-down policy and bottom-up change jointly lead to effective health interventions.

CAPITALIZING ON CHANGE: HABITUS TRANSFORMATION AND CANCER MITIGATION IN THE FIELD OF FIREFIGHTING

– *“There are two things that we hate in the fire service. Change and the way things are” (Research Interview 25).*

Despite evidence-based interventions, pro-health behaviors often fail to take hold. Information-based campaigns, such as warning labels on cigarette packages or vaccine mandates (Carpiano et al., 2023; Thrasher et al., 2016), may increase awareness without producing lasting behavioral changes. Health innovations are most likely to generate transformative changes when they are valued and normalized as socially accepted practices.

Fundamental cause theory (FCT) offers an account of the uneven distribution of health practices (Clouston and Link, 2021; Phelan et al., 2010). Its central insight is that people and groups possessing greater flexible resources, including knowledge, money, power, prestige, and social connections, are repeatedly able to convert these resources into health advantages under changing circumstances (Link and Phelan, 2025). FCT has also called for adopting a broad “social shaping” perspective and integrating with other theoretical perspectives (Link, 2008). Scholars have strived to integrate Bourdieu’s field theory with FCT based on their close interconnections (Freese and Lutfey, 2011; Mrig, 2021; Veenstra, 2018), and they have also advocated qualitative investigations to identify the micro-level processes through which health practices become normalized within social settings (Lutfey and Freese, 2005; Mrig and Spencer, 2018).

Our study builds on these earlier works to specify the social processes through which flexible resources emphasized by FCT become translated into durable health practices within a particular institutional field. We situate our research in a professional field of firefighting, one

that has faced an epidemic of cancer (LeMasters et al., 2006). Fire service leaders and medical scholars have identified a range of strategies to reduce carcinogenic exposure, including risk education, medical screenings, improved diet and exercise programs, and protective equipment use and decontamination (Caban-Martinez et al., 2019; Glasgow et al., 2024; Hardy, 2022). However, these approaches tend to emphasize top-down policy changes and organizational mandates, which appear insufficient to change health behaviors. Cancer has remained the leading cause of occupational death among firefighters (NIOSH, 2024).

We argue cancer mitigation is far from a technical or educational problem. From a social science perspective, firefighting has traditionally been organized around a masculine culture that glorifies risk-taking and cultivates unhealthy lifestyles (Desmond, 2007; Maglio et al., 2016; Martínez-Fiestas et al., 2020). Together, these circumstances present formidable barriers to the uptake of healthy behaviors.

While much of the U.S. fire service has struggled with effective cancer mitigation, we present a case study situated in California that indicates that durable changes can occur. We treat our analysis as a “critical case” where social changes can be observed in a concentrated form, thereby allowing key social processes and mechanisms to be uncovered (Yin, 2014). The California fire service frequently operates at the forefront of regulatory and technological changes, possesses relatively strong institutional resources, and has been an early adopter of cancer mitigation policies and strategies (Jung, 2025; Melhado, 2025). Despite such a favorable institutional environment, behavioral changes must occur at the micro-level in which traditionally defined professional knowledge, masculine culture, and cohesive networks have deterred pro-health actions. The key puzzle, then, is how flexible resources are mobilized, reconfigured, and aligned, ultimately generating durable health practices among firefighters.

Drawing on insights from earlier studies (e.g., Carpiano and Moore, 2020; Freese and Lutfey, 2011; Shim, 2010; Veenstra, 2018), we integrate Bourdieu's (1984, 1986, 1990) field theory with FCT to conceptualize the multidimensional social processes transforming health behaviors. Drawing on 48 in-depth interviews with California firefighters, we analyze how multiple forms of capital (e.g., cultural, symbolic, and social capital) are mobilized simultaneously to reshape a habitus within a field. We find that diffused information becomes more effective only after it has gained significance as the cultural health capital (Shim, 2010). Such expanded cultural capital relies on redefining symbolic capital by reconstructing the symbolic meaning of cancer mitigation and destigmatizing the use and decontamination of protective gear, such as personal protective equipment (PPE) and self-contained breathing apparatus (SCBA). Finally, social capital embedded in cohesive networks has been reoriented to diffuse cancer prevention knowledge and reinforce new norms and symbolic meanings. Health practices become more durable when these three forms of capital are reconfigured altogether to transform the habitus of firefighters.

By integrating FCT and Bourdieu's field theory, our study extends and enriches both theoretical perspectives to explain durable behavioral changes. While Bourdieu's framework and concepts (e.g., capital and habitus) have gained increasing attention in medical sociology (e.g., Carpiano and Moore, 2020; Freese and Lutfey, 2011), few studies have examined multiple types of capital (e.g., cultural, symbolic, and social) simultaneously. Our study demonstrates how these multiple types of capital are *reconfigured concurrently* to successfully transform the entrenched habitus and lead to durable changes in health practices. Meanwhile, FCT helps enrich the Bourdieusian explanation by showing how "flexible" those resources can be expanded, redefined, and reoriented toward transforming health practices.

Whereas FCT explains why flexible resources generate health advantages under changing circumstances, Bourdieu provides a set of interconnected concepts to help specify how multidimensional resources are employed as various types of capital. It also extends FCT to incorporate sociocultural explanations and illustrate how those resources become culturally legitimate, symbolically valued, socially consolidated, and routinely enacted within a particular field, thus transforming habitus and producing durable health practices through “multifactorial processes” (Veenstra and Abel, 2019).

CAPITAL AND HABITUS IN A PROFESSIONAL FIELD

Conventional Capital and Habitus in the Fire Service

We use Bourdieu’s (1984, 1986, 1990) field theory to conceptualize how knowledge, value, and social relationships structure health behaviors. Professional fields (Zietsma et al., 2017) contain specific forms of capital—cultural, symbolic, and social—that help shape the normalization and diffusion of health practices. *Cultural capital* is the embodiment and institutionalization of specific knowledge and understandings that facilitate individuals’ access and actions within the field. *Symbolic capital* refers to traits, objects, or honors that have symbolic value and grant respect and status in a field. *Social capital* consists of resources embedded in social networks and cohesiveness based on group membership. Together, these three types of capital generate a field-specific habitus consisting of a set of dispositions, tastes, and habits (Bourdieu, 1984, 1990).

Because the fire service is a paramilitary institution, these forms of capital have traditionally been organized around masculinity, competence, and risk-taking (Desmond, 2007; Zhao et al., 2025). Traditionally, professional knowledge and skills functioned as cultural capital.

In wildland firefighting, for example, knowledge of the forest and the ability to use tools became cultural capital and credentials to join the profession (Desmond, 2006). Symbolic capital in the fire service was embodied in dirty gear and “salty” helmets (Harrison et al., 2017; Maglio et al., 2016). As a paramilitary institution, the fire service features abundant social capital based on rigid boundaries between insiders and outsiders, extensive networks, and high social cohesion (Desmond, 2007). Firefighters live and work together for extended periods (e.g., 24- or 48-hour shifts), reinforcing perceptions of the crew as a “second family.” The social capital within the tight-knit firefighter community consolidates the cultural and symbolic capital in this professional field.

Historically, the firefighting habitus romanticized risk-taking dispositions and normalized masculine-coded behaviors, such as fighting fires without wearing an SCBA (“smoke eating”) or using heavily charred helmets as a symbol of experience (Desmond, 2007; Harrison et al., 2017; Zhao et al., 2025). This habitus has concrete health consequences. For example, firefighters who endorsed dirty gear as a badge of honor were more than twice as likely to engage in behaviors that exposed them to carcinogens, such as wearing contaminated gear after fires or eating with soot on hands (Wolffe et al., 2023). Altogether, traditional forms of cultural, symbolic, and social capital as well as the resulting habitus present formidable barriers to cancer mitigation among firefighters.

Reconfiguring Conventional Capital for Cancer Mitigation

Despite entrenched tradition and habitus, recent scholarship highlights that Bourdieu’s theory also offers valuable insights on social transformations in a field (Fowler, 2020; Petzke, 2022). Building on these theoretical insights, we extend the Bourdieusian perspective in medical sociology by emphasizing how field-specific capital can be reconfigured over time, particularly

in response to new institutional interests and organizational goals (Fligstein and McAdam, 2012). In the fire service, firefighters can mobilize resources to redefine what counts as desirable knowledge, values, and practices related to cancer mitigation. In this process, new forms of cultural and symbolic capital can take hold, while social capital provides the relational infrastructure to facilitate such changes.

Prior work shows field-specific medical knowledge functions as “cultural health capital” (Shim, 2010) to shape interactions with health systems and risk management (Araki, 2025; Chang et al., 2016; Dubbin et al., 2013). When the fire service traditionally emphasized professional competence and narrowly defined firefighting knowledge and skills as key cultural capital, cancer prevention was peripheral and cancer risks were often ignored. Only after the fire service institution and organizations promote and diffuse information on carcinogenic exposures and cancer risks, does such knowledge become valuable cultural health capital, which improves firefighters’ awareness and ability to mitigate cancer.

Knowledge alone, however, may not generate durable changes, as symbolic capital can override rational risk assessment, particularly in a masculine culture (Courtenay, 2000; MacArthur et al., 2017). Within the fire service, masculinity and tradition have shaped the meanings of firefighting gear (Desmond, 2007; Weick, 1996). For changes to take hold, the symbolic meanings attached to safety protection practices, including using PPE/SCBA, must be reconstructed as a positive marker of professionalism rather than a stigmatized sign of insufficient masculinity.

In a tight-knit community, the emergence and diffusion of newly developed cultural and symbolic capital rely on social capital, which can serve as a double-edged sword to deter or facilitate social changes (Portes, 1998). While cohesive social networks can entrench the

traditional habitus, they can be reoriented toward diffusing and consolidating new forms of capital—channeling cancer mitigation knowledge as expanded cultural capital and collectively reconstructing clean gear as a positive symbol. This reflects the “collective health agency” (Clouston and Link, 2021) and produces “spillover” effects (Freese and Lutfey, 2011) in facilitating the uptake of cancer mitigation.

Altogether, achieving effective cancer mitigation in the fire service requires coordinated reconfiguration of multiple types of capital: cultural capital must expand to include knowledge about cancer risks as field-specific cultural health capital (Shim, 2010); symbolic capital must emphasize self-protection, rather than risk-taking, as a marker of professionalism; and social capital must disseminate and consolidate these changes through cohesive networks. When these forms of capital align, they can transform a recalcitrant habitus, leading to lasting behavioral changes and better health outcomes.

While our analysis centers on the micro-level reconfiguration of capital and habitus, it cannot be separated from the institutional process (Freese and Lutfey, 2011). From the field perspective (Bourdieu, 1990), such changes should be contextualized in the specific institutional environment, whose conditions shape how health innovations diffuse and endure (Link, 2008; Wang et al., 2012). Meanwhile, macro-level field conditions, which actors can strategically restructure as goals shift (Fligstein and McAdam, 2012), exert external pressures and prescribe cultural scripts that shape meso-level organizational policies and practices (Meyer and Rowan, 1977). Yet formal rules alone are insufficient: organizational adoptions can be ceremonial and “decoupled” from actual behaviors (Meyer and Rowan, 1977), unless social actors truly value promoted practices and enact them as professional routines (Stinchcombe, 1997).

METHODS

Our primary data are 48 in-depth, semi-structured interviews with California firefighters, ranging from 35 minutes to two hours (averaging about one hour). The protocol queried firefighters' perceptions of cancer causes and risks, use of protective gear (e.g., PPE and SCBA), and decontamination practices, and explored how professional work and identity shaped carcinogenic exposure. We also examined policy changes and the conditions under which firefighters followed or deviated from these procedures. Capturing lived experiences, social interactions, and behavioral patterns, this qualitative approach lets us trace how micro-level processes within specific institutional contexts shape the uptake of cancer mitigation, which is crucial for revealing mechanisms in FCT research (Lutfehy and Freese, 2005; Mrig and Spencer, 2018).

Our interviews were conducted virtually in the latter half of 2025, and we recruited participants through multiple channels in the California fire service. Study invitations were distributed via email to fire service officers (e.g., battalion chiefs, captains, and presidents of firefighter associations), who circulated them within their fire departments, firefighter communities, or professional networks. Recruitment continued until thematic saturation was reached, indicated by recurring findings and patterns across interviews. The final sample includes 48 firefighters from five fire departments and over 20 stations in urban areas across Southern and Northern California.

Table 1 shows participants' demographic and professional characteristics. While most interviewees are white and male, consistent with the composition of firefighters nationwide (Fahy et al., 2022), there are considerable variations in their rank, educational level, age (22 to 61), and tenure in the fire service (18 months to 30 years). Representation across multiple

geographic regions, organizations/stations, ranks and career stages allows us to capture a wide range of perspectives on cancer risk and mitigation among California firefighters.

[Table 1 about here]

We treat the California fire service as a “critical case” (Yin, 2014): a setting where cancer prevention appears to take hold despite a professional culture expected to resist health-behavior change. Several features make California advantageous. Its more progressive culture renders health-oriented norms and interventions salient (Wang et al., 2012), and its fire service is comparatively open to innovation, as in its early adoption of the modern LA-style helmet (Zhao et al., 2025). The state has pioneered relevant legislation, including a state-funded firefighter cancer research program (California Legislature, 2023) and a ban on PFAS in gear (California Legislature, 2025), and it pairs the nation’s highest firefighter salaries (Bureau of Labor Statistics, 2023) with substantial investment in prevention equipment and training (Jung, 2025; Melhado, 2025). Under these institutional pressures, departments and firefighter associations have launched cancer education programs, transitioned to PFAS-free gear, and adopted contamination-reduction policies (e.g., Maripuu, 2025; San Diego Fire Relief Association, 2026; San Francisco Firefighters Cancer Prevention Foundation, 2025). Participants in our interviews also echo this leading role, describing California as “pretty progressive on cancer prevention” (CA01) and “leading the profession ... in a lot of ways” (CA12). While it is still too early to determine whether the interventions will result in demonstrably lower cancer rates through this ongoing process, such a favorable environment and institutional processes provide crucial conditions to enable California firefighters to successfully mobilize and reconfigure various types of capital to transform habitus in cancer prevention (Freese and Lutfey, 2011; Wang et al., 2012).

To contextualize our interview findings within the broader fire service field, we further consulted firefighter industry periodicals and firefighter subreddit posts from the last ten years. These data captured public discussions and narratives involving various stakeholders, such as fire service leaders, experts, and rank-and-file firefighters. They also provided background on the broader institutional environment of the fire service and helped refine our interview guide. In addition, we conducted field research, including observations through ride-alongs with firefighters, at several fire stations. We triangulated our data from these multiple sources to strengthen our analysis.

We followed established qualitative research guidelines (Tong et al., 2007) and adopted an abductive analysis approach (Timmermans and Tavory, 2022). We used NVivo 15 to analyze the data. Rather than beginning with a fixed deductive coding scheme or relying purely on inductive generation of coding themes, we moved back and forth between empirical observations and theoretical concepts iteratively. Each interview was coded by at least two members of the research team. We began with open coding to identify the general themes and patterns in our data. The research team then independently coded a selected subset of interviews and compared codes and interpretations, refining analytic categories through iterative discussions (Miles et al., 2020). Through repeated rounds of discussions and triangulating the data and theoretical concepts, we developed a codebook covering cancer causes and risks, cancer awareness, cancer mitigation practices, multiple types of capital (cultural, symbolic, and social capital), and shifts in professional habitus (e.g., on SCBA/PPE use and decontamination). All interviews were subsequently coded using this codebook, adopting the standard of qualitative research (Tong et al., 2007).

RESULTS

Our findings demonstrate three interrelated processes through which cultural, symbolic, and social capital are reconfigured, producing a new habitus that normalizes cancer mitigation practices in the California fire service. Accordingly, we organize our results around these themes. First, we describe the expansion of cultural capital, focusing on how cancer knowledge and risk awareness have gained significance in firefighters' toolkit. Second, we discuss changes in symbolic capital, showing how protective equipment (PPE/SCBA) use is destigmatized and clean gear becomes a new badge of honor. Third, we examine how social capital helps diffuse and reinforce these emerging forms of capital. Finally, we show how capital reconfigurations give rise to a new habitus in which health-promoting behaviors become routine.

Expanded Cultural Capital: Valuable Knowledge on Cancer Risks

FCT has emphasized that the diffusion of information on health innovation is critical to the uptake of health practices (Link, 2008; Wang et al., 2012). But the effectiveness of such information is contingent on its legitimization and translation into field-specific cultural health capital (Shim, 2010). Firefighters traditionally value and grant status to those with professional knowledge and practical skills gained through work experience. As one participant describes: "A lot of reputation comes from where you've been, and what you've done, and what you've seen" (CA02). Historically, this narrowly defined cultural capital discouraged firefighters from valuing information about cancer risks and prevention, which was a critical barrier to cancer mitigation.

However, as the California fire service has promoted cancer prevention, our interviews suggest that firefighters increasingly appreciate such information as valuable cultural health capital (Shim, 2010). Many firefighters now discuss cancer risks and prevention as essential knowledge for their career success and long-term health outcomes. This new knowledge is

driven by “a tidal wave of information” (CA05) that comes from formal (e.g., professional education and training) and informal (e.g., social network) channels. Along with institutional promotion and policy changes, fire departments and academies incorporate cancer-risk knowledge into regular training programs and make cancer prevention salient by circulating information and normalizing discussion of exposure reduction. In a sense, cancer mitigation and pro-health knowledge have been “institutionalized” (Bourdieu, 1986) as a part of baseline education and training for firefighters, particularly new recruits in fire academy. As one participant notes:

“I’ve seen a huge change, because the guys coming on now, they’re really hit with that hard in the fire academies that, you have to have this [SCBA] on. This is going to save your life. This is going to protect you” (CA27).

Newly gained cultural capital helps change firefighters’ mindset and enhance their awareness of cancer risks. Firefighters increasingly understand cancer not as a distant possibility but as a core professional hazard. An interviewee notes how widely diffused information has made cancer prevention more salient and legitimate:

“I think the fire service as a whole [has] just seen a lot more cancer related deaths or cancer related diagnoses and things like that, just in general. And so... I think that has put the awareness out there. And then I think that also just trainings and everything too, I mean, putting it right in front of your face and whatnot. And people are starting to see [that], Oh, it’s *legit*” (CA03; emphasis added).

Institutional promotion, policy changes, and organizational initiatives all help expand the valued knowledge toolkit in the fire service beyond the narrowly defined professional understanding and skills in firefighting. As a result, knowledge of cancer mitigation is increasingly recognized as important qualifications and valued as new cultural health capital for firefighters. Such expanded cultural capital is crucial in changing dispositions and mindset. As one firefighter notes, “Decades ago, people didn’t know, and if you don’t know, how are you

going to take steps to avoid it?” (CA28). But now, after acquiring this expanded knowledge, “we’ve definitely adopted a more cancer awareness mindset, trying to mitigate that before it becomes a problem” (CA25).

Redefined Symbolic Capital: Clean Gear Replacing Dirty Gear as a New Badge of Honor

FCT has pointed out that information diffusion alone is insufficient to lead to the uptake of health practices, often due to competitive valuations and choice preferences over health, which are shaped by symbolic meanings of social behaviors (Clouston and Link, 2021). For example, men tend to engage in risky behaviors to assert their masculine identity (Courtenay, 2000), while women often prefer thinness over appropriate glucose control for diabetes treatment (Freese and Lutfey, 2011).

In the fire service, the conventional symbolic meaning of gear and the stigmatization of meticulous self-protection associated with the masculine culture and tradition form strong barriers to cancer mitigation. As one participant notes, “You’re going up against 100 years of tradition and all the old crusty guys with the dirty helmets—the symbol of pride and hard work” (CA33). Traditionally, as dirty gear was seen as a marker of experience and toughness, it became a badge of honor and one basis for earning professional status: “Whoever got the dirtiest [turnout] was considered the coolest” (CA39). Similarly, “smoke eating” was revered, while use of SCBA and other safety equipment was often stigmatized. One participant describes symbolic values as a key reason for firefighters opting out of cancer mitigation activities:

“So that whole machismo and toxic masculinity idea lends itself to firefighters not wearing or using safety tools, because the general, though inaccurate, perception is that it makes you weaker. And that’s a big reason why a lot of people won’t use things that could mitigate long-term health issues” (CA32).

This kind of traditional symbolic value dampens their desire to engage in cancer prevention practices. In this light, redefined symbolic capital will be crucial in cancer prevention

among firefighters. Our interviews suggest that dirty gear and SCBA avoidance are increasingly reframed as indicators of poor judgment and being “immature” rather than signs of bravery and toughness. Instead of dirtiness conferring masculine identity and status, cleanliness and pro-health behaviors now carry positive symbolic meanings. Some explicitly draw comparisons between previous understandings of gear and current perceptions:

“You know, years ago, it was a badge of honor to have the dirtiest, grimmest PPE and equipment, because it showed us, kind of a machismo ego thing that you had... you have, like, experienced a lot of [other] things than the person with the cleaner, newer gear... As elementary and immature as that was, it just wasn’t the case at the time. I think we’re doing a good job with educating our people now that, like, it’s not appropriate to have dirty gear like that anymore” (CA02).

The new focus on clean gear as symbolic capital reflects a shift in values associated with a reconstructed firefighter identity, featuring social responsibility and expanded cancer prevention knowledge. While bravery and valor continue to be respected in the field, several interviewees point out that firefighters are not “invincible,” directly challenging iconic “macho” symbols and legitimizing self-protection behaviors. Such a changing mentality alters their symbolic interpretations of using protective equipment like SCBA:

“...and what I guess I’m getting at is, it’s the pride thing. It was like, if I were to get caught... breathing on a [SC]BA, somebody would have called me a pussy, and it’s like, I don’t... even if that thought was in my head, I didn’t want to look like an idiot, so I’m not gonna do that. Now, again, age and wisdom, I could care less how uncool you think I am.” (CA05).

Firefighters have redefined the symbolic meanings of gear and view self-protection and cancer mitigation as no longer at odds with bravery and honor. This shift in symbolic capital unlocks prestige as a flexible resource: what once obstructed health—where dirty gear signaled toughness and caution signaled weakness—is reconfigured so that protective practice itself confers honor: “I want to be safe and have a happy retirement. So, I’ll clean my stuff and... take pride in doing it” (CA07). Through this change, many firefighters further draw on other symbolic

values, such as health and life, family, and public service, to legitimize cancer mitigation.

Multiple firefighters emphasize their family as a sacred responsibility: “Firefighting’s my job, it’s not my life, so my life is what I have at home... My family who lives close to me, so... that’s always my priority, and when I’m at work, my job is to return home safely” (CA21). Another firefighter notes: “If we get sick, we’re not able to provide for our family, right? I want to see my kids grow up, I want to spend a lot of time with my wife” (CA11).

Finally, firefighters cite clean gear and appropriate use of protective equipment as a new symbol of professionalism. One firefighter claims: “If I clean my gear, I will get a less chance of cancer or being sick, therefore I will be present to be able to help more people” (CA17). Another commends self-protection measures that embody the value of public service:

“I think that by being proactive with our lungs, and the SCBAs, and mindful of cleaning our turnouts, and... I think that embodies that service mentality, because that’s keeping us healthy, and it’s... in turn, if we’re healthy, we can help the others” (CA26).

Clearly, the public-service framing facilitates this symbolic shift. When cancer prevention is no longer interpreted as “coward” self-protection as a stigma of masculinity (Link and Phelan, 2001), but rather reframed as aligning with providing better altruistic service to the public, it becomes compatible with firefighters’ professional values as clean gear now embodies a new badge of honor.

Reoriented Social Capital: Consolidating New Cultural and Symbolic Capital

While social capital can help acquire and consolidate cultural and symbolic capital (Bourdieu, 1986, 1990), it can serve as a double-edged sword to deter or facilitate social changes (Portes, 1998). Firefighters live and work together during long shifts and frequently describe their fire station as a “home away from home” and emphasize that “we do all things as a collective group.” In the past, their cohesive networks spread and consolidated narrowly defined

cultural and symbolic capital, including professional knowledge and glorification of dirty gear, thus forming social barriers to cancer prevention.

However, our data show how these networks have been reoriented toward enhancing cancer mitigation. First, they facilitate the spread of cancer knowledge as new cultural capital:

“We have an internal gentleman who’s really into cancer prevention. So, he’s really good at bringing information and bringing new ideas and products. So, like, the sprays and the wipes after incidents, we carry on all of our apparatus now. He’s a good advocate for that kind of stuff, so his information is shared easily amongst our department” (CA11).

Moreover, social capital, embodied in camaraderie, also enforces new norms and symbolic meanings around gear use and decontamination. As one firefighter explains, “I think personal relationships and the want and desire to see the people you work with be healthy, it definitely has an impact” (CA21). Firefighters who fail to clean gear or appropriately wear PPE are subject to public reminders or teasing, including being labeled as “grimy,” “stinky,” or “gross.” One firefighter notes, “If my turnout pants were dirty, my crew would probably make a comment or, you know, kind of poke fun” (CA06). Some veteran firefighters are also very active in monitoring junior colleagues: “If I see a young guy not wearing his mask, I’m gonna be like, ‘dude put your mask on you moron’” (CA13).

These examples show that firefighters produce new norms through cohesive networks. Peer reminders, joking, correction, mentorship, and modeling make cancer mitigation collectively salient and socially enforceable. In a tight-knit community, behavioral changes have a ripple effect: “If you see everyone around you wearing [their] SCBA, you’re gonna wear it. If you see everyone around you washing their gear, you’re gonna wash yours” (CA15). It shows the “spillover” effects (Freese and Lutfey, 2011) and “collective agency” (Clouston and Link, 2021) in facilitating the uptake of cancer mitigation.

Transformed Habitus: Perspective and Behavioral Changes in Cancer Mitigation

The old firefighting habitus was characterized by risk-taking dispositions and masculine-coded health practices (Desmond, 2007), including an unhealthy lifestyle (e.g., excessive drinking, tobacco use, unhealthy diet). However, concurrent reconfiguration of cultural, symbolic, and social capital generates a new habitus by changing firefighters' hearts and minds. Now firefighters are more attentive to long-term health consequences:

“I mean, when you see that stuff first-hand, you know, young guys getting cancer, folks dying from cancer that are on the job. Like, it certainly changes your perception... and I'm a lot more aware of those things, and definitely try to take every mitigation possible to try to avoid that” (CA25).

Along with redefined symbolic capital and destigmatization of self-protection, firefighters are willing to integrate cancer mitigation into their daily routines. Safety measures, such as masking during overhaul and prioritizing post-fire decontamination, are increasingly normalized. One firefighter notes: “During overhaul, you'll see way more people using their own protection ... I also see more guys keeping their SCBA on longer than they ever used to, for sure” (CA47).

Younger generations of firefighters appear to more readily adopt the new habitus because they have been more exposed to pro-health institutional environment and organizational policies and have received cancer-prevention education and training in the fire academy from the outset. As one participant notes: “Younger cohorts tend to have a better mentality around safety culture” (CA37). Another firefighter echoes this and further highlights the generational difference:

“I think they're more clean in terms of like they are, they grew up with that. So they grew up with the, yeah, put your mask on, son, and then in the 80s, it's like, what are you doing? We have cigars and we're pulling down the ceiling. So it's a different culture, different generation, and that awareness and safety and what's pumped in their heads in a positive way. I think it helps the younger generation more” (CA17).

Despite being more influenced by the traditional habitus, older generations of firefighters have also experienced personal transformation and gradually gravitated toward the new habitus: “Once I got the knowledge about cancer, I started washing my turnout religiously after every [fire]... even every car fire” (CA15). Another firefighter echoes this: “Now, if I ever get calls [to a structural fire], I don’t play games. I mask up, and I’ll stay masked up until I’m off that property... I care more about my health than I did being [a] new fireman” (CA05). These veterans have been “reborn” with the new habitus.

In addition to changes in gear use and cleaning, firefighters also describe broader lifestyle changes, including taking a shower right after fires, applying sunscreen, exercising, eating more carefully, and pursuing medical screening. In a sense, cancer mitigation moves beyond immediate safety measures and involves a paradigm-shift in their lifestyle, which can have long-term health implications (Cockerham, 2005).

DISCUSSION

Although fire service leaders and medical scholars have identified multiple strategies to reduce cancer risks among firefighters, it remains the leading cause of firefighter death (NIOSH, 2024). The persistence of cancer highlights a central puzzle: why does the existence and accessibility of health innovations not guarantee adoption? FCT emphasizes that health advantages depend on flexible resources, especially when risks become preventable or newly actionable (Clouston and Link, 2021). Yet FCT is less explicit about how these resources become meaningful or durable within specific institutional fields. Drawing on 48 in-depth interviews, we argue that cancer mitigation in the California fire service is beginning to take hold because firefighters are successfully transforming their habitus through expanding cultural health

capital (Shim, 2010), redefining symbolic capital, and reorienting social capital. By integrating Bourdieu's field theory and FCT, our research enriches and extends both theoretical perspectives and advances medical sociology in several important areas.

First, while medical sociology has drawn broad insights from Bourdieu's field theory, prior work often highlights one type of capital, such as cultural capital (e.g., Collyer et al., 2017; Shim, 2010), symbolic capital (e.g., Lunnay et al., 2011), or social capital (e.g., Carpiano and Moore, 2020). Relatively few studies have examined multiple types of capital simultaneously (e.g., MacArthur et al., 2017; Thompson-Lastad et al., 2025; Veenstra and Abel, 2019). By adopting a more holistic approach that investigates three forms of capital, we emphasize mobilizing each form of capital is necessary, but none is sufficient on its own to transform an entrenched habitus. This illustrates the interrelated nature and power of mobilized capital in health interventions. FCT also enriches the Bourdieusian perspective by showing that various types of capital are not fixed and static, but very "flexible" and can be reconfigured concurrently to transform health practices.

Second, by building on earlier work (Freese and Lutfey, 2011; Mrig, 2021; Veenstra, 2018) to incorporate Bourdieu's perspective, our study also extends FCT. Bourdieu's various types of capital offer refined specifications of multidimensional flexible resources. Our analyses of three types of capital further highlight these flexible resources can be expanded, redefined, or reoriented in the fire service. These help to substantiate and enrich FCT's explanations of mobilization and reconfiguration of flexible resources in health interventions.

Third, while FCT has offered structural explanations on health inequalities and outcomes, this study further incorporates sociocultural factors to better understand subtle barriers to health uptake, such as competitive valuations and choice constraints (Clouston and Link, 2021), and to

refine explanatory mechanisms, such as habitus (Freese and Lutfey, 2011). In firefighting, information on cancer prevention and protective technologies must pass through the symbolic economy of the field. If dirty gear is valued as a badge of honor and self-protection is perceived as a social stigma, health-protective resources will remain underused. By contrast, when clean gear and SCBA use are reframed as signs of professionalism, those same flexible resources become more likely to shape everyday practice and transform habitus, improving health outcomes. In this light, the flexible resources that are crucial in FCT operate not only through access, but also through cultural recognition, symbolic reframing, peer reinforcement, and normalized incorporation into a habitus. Thus, the Bourdieusian perspective helps specify the field-level conversion processes through which resources become effective. From this perspective, efforts to address cancer among firefighters, like many other health interventions, are far beyond a technical or educational problem, but rather a sociocultural issue and thus require the “social shaping” perspective (Link, 2008). To be effective, we need to change actors’ hearts and minds shaped by the broad culture and social norms (Link and Phelan, 2001).

Fourth, this study enriches FCT by incorporating Bourdieu’s field perspective. While FCT has long emphasized the social context, we embed our research in a well-defined field of the California fire service. An institutional field is more than a specific context, but rather defines flexible resources as meaningful capitals, prescribes actors’ valuations and choices, and shapes resource mobilization and configurations (Bourdieu, 1984, 1986, 1990). Although our empirical analyses focus on resource employment and habitus transformation among firefighters, these indicate the “collective health agency” (Clouston and Link, 2021) and have to be appreciated in a field with a specific institutional environment, culture, and tradition.

From this perspective, while we highlight micro-level social transformation in health practices among California firefighters, such successful transformation is still dependent on the more favorable macro-environment and institutional conditions (Freese and Lutfey, 2011) of the California fire service. As the state, firefighter associations, and medical scholars all promote policy changes, academy training, equipment investment, and medical screening, they impose institutional pressures on fire service organizations to adopt cancer prevention initiatives and programs. All these help spotlight cancer as a serious “problem” in the field, channel organizational expectation, and legitimate and normalize self-protection and cancer mitigation; institutional policies and organizational support also provide essential resources and momentum to facilitate resource mobilization and reconfiguration among firefighters (Meyer and Rowan, 1977). In this light, alignment between top-down institutional and organizational changes in formal policies and bottom-up habitus transformation among individuals is the key to successful health interventions.

From such a field perspective, our study can have broad implications and our framework may apply to other professional fields, including other risky occupations, where health practices conflict with the established professional culture (Stergiou-Kita et al., 2015). Research on mining, for example, has shown how the masculine work culture can normalize risk-taking and make safety practices difficult to implement (Somerville and Abrahamsson, 2003). Similarly, in policing and military contexts, the occupational culture of toughness and self-reliance makes mental health service uptake challenging (Burns and Buchanan, 2020; Silvestrini and Chen, 2023). These cases suggest that the problem identified in our study is not unique to firefighting. Across risky occupations, health interventions may be more durable when they do not simply

provide information and material resources, but also rework the cultural, symbolic, and social conditions to facilitate habitus transformation and behavioral changes.

Limitations and Future Directions

While we suggest that the California fire service offers important insights in medical sociology, we acknowledge limitations in our study, which also point to directions in future research. First, although we have highlighted significant progress in cancer mitigation among California firefighters, we note that these changes are neither uniform nor universal. We do observe uneven adoption of cancer mitigation behaviors among firefighters across generations, career stages, and organizations, such as in regard to perceptions of cancer risks, SCBA use (particularly during overhaul), and decontamination activities. For example, as discussed above, younger generations of firefighters are more exposed to cancer prevention knowledge (now embedded in academy training) and more easily adopt cancer mitigation practices. FCT's emphasis on varied access and use of resources can help explain some variations in health practices among firefighters as well as fire departments. While we answer the call in FCT and adopt qualitative research to generate key insights on the micro-level processes and mechanisms underlying inequality or changes in health practices (e.g., Lutfey and Freese, 2005; Mrig and Spencer, 2018), our interview data, based on a small sample size, have limitations in fully capturing and explaining subtle variations in cancer mitigation practices across multiple dimensions. Future research using large-scale survey data can complement our qualitative research and shed important light on this aspect.

Second, while our research has highlighted micro-level pro-health changes as well as field-level characteristics, our interview data focusing on firefighters' behaviors do not allow us to systematically examine meso-level organizational processes that can mediate social

transformation. Indeed, prior work suggests health outcomes are impacted, in part, by organizational resource allocation processes (Huft and Guardino, 2025). Future work with in-depth organizational-level data (cf. Lutfey and Freese, 2005) can further analyze how the organizational environment, policy, and culture may facilitate or deter capital reconfiguration and habitus transformation in a local firefighter community.

Third, while our analysis of the California fire service suggests significant changes in cancer mitigation, we note that California features a more open and progressive institutional environment, and California firefighters are generally better resourced, paid, and educated than firefighters in many other states (Bureau of Labor Statistics, 2023). Future research can conduct comparative analysis in another state (e.g., along the East Coast) with more entrenched fire service traditions to deepen our understanding of how varied institutional environments and conditions can shape firefighters' cancer mitigation practices. Meanwhile, in recent years, cancer mitigation in the fire service has attracted attention nationwide and prompted congressional legislation (e.g., U.S. Congress, 2025). Large-scale survey data can also help examine the diffusion of cancer mitigation practices across regions in the U.S. fire service (see Wang et al., 2012), and the institutional field perspective can provide theoretical guidance to such analysis (Meyer and Rowan, 1977).

CONCLUSION

This research provides key insights into the social processes underlying successful transformation in health behaviors within a field. Importantly, our findings have implications for how health interventions should be implemented. While approaches to cancer mitigation in firefighting often emphasize top-down policy changes (Caban-Martinez et al., 2019; Glasgow et

al., 2024; Hardy, 2022), our study suggests that a bottom-up collective endeavor is essential to catalyze and sustain social changes. Information availability and diffusion alone are insufficient. Policies that do not engage the field's sociocultural factors—that fail to address what behaviors *mean* culturally, symbolically, and socially within the field—are likely to encounter resistance. Durable changes are more likely to occur if there is a coordinated alignment of cultural, symbolic, and social capital. It is particularly crucial to destigmatizing pro-health activities and reconstructing symbolic meaning to transform the habitus (Link and Phelan, 2001). In a specific sociocultural context, effective health interventions thus rely on “collective” social construction and endeavors (Carpiano et al., 2023; Cockerham, 2005), instead of isolated individual effort.

The California fire service illustrates how the uptake of health practices can succeed in a context where resistance would be expected. Much medical sociology research focuses on populations constrained by structural barriers. By examining a case where resource reconfigurations appear to be working, despite a masculine culture and entrenched tradition, we gain insights into the mechanisms that allow health behavior changes to become durable. Understanding successful transformations in an unlikely setting provides leverage for designing more encompassing and effective interventions in many other fields.

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Table 1. Participant Demographics (N = 48)

Position / Rank		
Firefighter	21	(43.8%)
Engineer	10	(20.8%)
Lieutenant	2	(4.2%)
Captain	9	(18.8%)
Battalion / Division Chief	5	(10.4%)
Investigator / Specialist	1	(2.1%)
Educational Attainment		
Some College	12	(25%)
Associate's Degree	10	(20.8%)
Bachelor's Degree	17	(35.4%)
Master's Degree	9	(18.8%)
Male	44	(91.7%)
White	38	(79.2%)
Age (Mean/SD)	41.9	(8.6)
Tenure (Mean/SD)	16.7	(7.9)

Note: Age and tenure report the mean (in years) and the standard deviation in parentheses.