


# Overcoming Barriers in Unhealthy Settings: A Phenomenological Study of Healthy Truck Drivers

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## Abstract

We investigated the phenomenon of sustained health-supportive behaviors among long-haul commercial truck drivers, who belong to an occupational segment with extreme health disparities. With a focus on setting-level factors, this study sought to discover ways in which individuals exhibit resiliency while immersed in endemically obesogenic environments, as well as understand setting-level barriers to engaging in health-supportive behaviors. Using a transcendental phenomenological research design, 12 long-haul truck drivers who met screening criteria were selected using purposeful maximum sampling. Seven broad themes were identified: access to health resources, barriers to health behaviors, recommended alternative settings, constituents of health behavior, motivation for health behaviors, attitude toward health behaviors, and trucking culture. We suggest applying ecological theories of health behavior and settings approaches to improve driver health. We also propose the Integrative and Dynamic Healthy Commercial Driving (IDHCD) paradigm, grounded in complexity science, as a new theoretical framework for improving driver health outcomes.

## Keywords

behavior change, complexity, health behavior, obesity / overweight, work environment, interviews, phenomenology, reflexivity

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## Introduction

The prevalence of obesity has grown in the United States in recent decades (Ogden, Carroll, Kit, & Flegal, 2012). There has been an increased emphasis on the role of the environment in influencing obesity-related behavior (Larson & Story, 2009). For obesity-related health promotion efforts, environment and setting are crucial: Addressing the context in which people make these health decisions is critical in achieving individual behavior change (Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008). Barriers in the environment discourage individuals from eating healthy and from engaging in physical activity, resulting in increased energy intake and decreased energy output (Wells, Ashdown, Davies, Cowett, & Yang, 2007). Conversely, environmental supports encourage eating healthy and engaging in physical activity, resulting in decreased energy intake and increased energy output (Wells et al., 2007).

overweight or obese (Apostolopoulos, Sonmez, Shattell, Gonzales, & Fehrenbacher, 2013). Health care costs for drivers who are obese are significantly higher: Obese drivers average US\$1,944 in annual health care costs, compared with US\$1,131 for normal weight drivers (Martin, Church, Bonnell, Ben-Joseph, & Borgstadt, 2009). Driver obesity is also associated with diminished driver productivity, as well as increased absenteeism, presenteeism, driver turnover, and lost-time injuries, affecting revenues for trucking companies (Apostolopoulos, Peachey, & Sonmez, 2011). Obesity appears to be linked to increased frequency of accidents: One recent study indicated that drivers with a body mass index (BMI) above 35 have 47% to 63% higher crash rates than drivers with BMIs in the normal range (between 18.5 and 25; Anderson et al., 2012). Life expectancies of truck drivers are estimated to be 16 years shorter than

## Health Promotion Among Truck Drivers

Long-haul truck drivers experience excess health hazards that are endemic to their profession. A recent survey of drivers found that nearly 80% included in the study were either

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the average American (Ferro, 2010). Health issues often force drivers out of the profession because they are unable to meet the legal physical requirements to operate a commercial motor vehicle (Krueger, Belzer, et al., 2007).

The factors that influence driver health are complex and occur at a number of different levels of influence (Apostolopoulos, Sonmez, Shattell, & Belzer, 2011). The unique nature of the occupation makes truck drivers' workplace settings particularly relevant to driver health. Multiple locations and worksites can be considered trucking settings (Apostolopoulos, Sonmez, Shattell, & Belzer, 2011). They include such diverse entities as truck stops, truck plazas, trucking terminals, warehouses, truck cabs, rest areas, and other highway facilities (Apostolopoulos, Sonmez, Shattell, & Belzer, 2011). Because of the mobility of the truck driving occupation, drivers are particularly dependent on, and also vulnerable to, the milieu of these settings (Apostolopoulos, Sonmez, Shattell, & Belzer, 2011). Unlike other occupations, where workers return home at the end of their working day, truck drivers are away from their homes for weeks at a time, usually only getting home one or two weekends per month (Apostolopoulos et al., 2012). Truck drivers spend much of their time in these settings when not working; therefore, trucking settings essentially become their homes when on the road (Apostolopoulos et al., 2012; Apostolopoulos, Sonmez, Shattell, & Belzer, 2011). Because of this, truck stop and trucking terminal policies, resources, and amenities have significant impact in the transportation environment on trucker health (Apostolopoulos, Sonmez, Shattell, & Belzer, 2011). In addition, trucking company policies play out in these settings, further affecting driver health (Apostolopoulos, Sonmez, Shattell, & Belzer, 2011).

Trucking settings, particularly truck stops, are notorious for being unhealthy, presenting numerous barriers to engaging in healthy behaviors (Apostolopoulos, Sonmez, Shattell, & Belzer, 2010, 2011). Access to healthy food and physical activity are scarce, thus negatively affecting eating behavior and physical activity patterns (Apostolopoulos, Sonmez, Shattell, & Belzer, 2011). Foods offered at truck stops are often deep-fried and high in sodium and fat (Apostolopoulos, Sönmez et al., 2010). Trucking settings encourage sedentary behavior and restrict engagement in physical activity (Apostolopoulos et al., 2012). These built environments seemingly collude with the psychosocial and physical strain that professional drivers experience, which often generate coping strategies which negatively influence health behaviors (Apostolopoulos, Lemke, & Sonmez, 2014). In sum, truck driver workplace settings have been described as "active living deserts" and "healthy food deserts," thus contributing to the poor health of truck drivers (Apostolopoulos et al., 2012; Apostolopoulos, Sonmez, Shattell, Haldeman, et al., 2011).

### *Health Promotion in the Trucking Industry*

The truck driving profession remains underserved in terms of health promotion, as drivers reported that health promotion programs were unavailable in more than 70% of trucking

companies and almost 81% of truck stops (Apostolopoulos et al., 2013). The Federal Motor Carriers Safety Association (FMCSA), the major regulatory and governing body of the trucking industry, continues to consider truck driver "lifestyle choices" to be the major health determinants, thereby placing the blame solely on the drivers themselves (Apostolopoulos, Sonmez, Shattell, & Belzer, 2011; Apostolopoulos, Sonmez, Shattell, Haldeman, et al., 2011).

Prevailing strategies within the trucking industry to address the significant problem of obesity are generally based on the individual, focusing on addressing lifestyle factors; in addition, they are usually reactive, relying on tertiary efforts to mitigate the impacts of obesity after they have already occurred (Apostolopoulos, Sonmez, Shattell, Haldeman, et al., 2011). These programs are often underfunded, fragmented, and usually exist in "silos"; as a result, impacts on obesity rates are minimal, gaps exist between best practices and what actions are actually undertaken to address obesity, and key stakeholders that could be utilized to initiate change are excluded (Krueger, Brewster, Dick, Inderbitzen, & Staplin, 2007).

One particularly daunting task in improving driver health, and one of the major failures in interventions up to this point, is addressing setting-level barriers to sustaining healthy behaviors that are endemic to the trucking profession. Unfortunately, there is a dearth of research pertaining to how the occupational environment of the trucking industry influences driver health and participation in health promotion programs (Apostolopoulos et al., 2014). This study sought to discover the ways in which drivers are able to exhibit resiliency when confronted with barriers to engaging in health-supportive behaviors and remain healthy while existing in endemically obesogenic environments, as well as to increase understanding of the setting-level barriers to engaging in health-supportive behaviors for truck drivers in their worksites.

## **Method**

### *Design*

The research design used in this study is a qualitative approach called transcendental phenomenology, where the goal is to be receptive and naïve in listening to participants describing their experiences (Moustakas, 1994). In transcendental phenomenology, the researcher seeks to generate a study that is as free as possible from preconceptions, beliefs, and knowledge of the phenomenon, whether these stem from prior experience or knowledge of previous studies (Moustakas, 1994). Because the principal investigator is a former commercial driver, this approach was deemed essential to accurately listen and interpret insight from participants and avoid introducing bias as much as possible. The end product is a descriptive passage, typically a paragraph or two in length, called the "essential, invariant structure," which is

a composite description that represents the phenomenon under investigation (Creswell, 2013).

### Setting

Currently employed long-haul truck drivers were interviewed via Skype. Long-haul truck drivers were chosen because of their extreme dependence on their workplace settings: They often spend weeks or even months away from home, and during this time, they spend their on- and off-times in these settings. Skype interviewing was the most pragmatic approach to conducting the interviews, as this population is highly mobile, and participants were dispersed across a wide geographic region.

### Participants

Participants were interviewed until reaching sufficiency and saturation (Seidman, 1991), which was achieved with a total of 12 participants. Of the 12 participants, four were female and eight were male; four were single and eight were married; ages ranged between 31 and 63 years; years of experience as a commercial driver ranged from 3 to 41 years; and average miles driven per week ranged from 1,750 to more than 3,000. Thus, a wide range of relevant demographic characteristics were captured in this sample. Numerous safeguards were employed to ensure informed consent, confidentiality and anonymity, justice, and benevolence and non-maleficence. Each participant was given and agreed to an informed consent form, which was approved by Wichita State University's institutional review board. The form described the purpose of the study, indicated any possible benefits and harm that may result from their participation, and identified the researchers involved in this study. It also indicated to the participants that they may end the interview at any point in time should they so choose. All participants received an electronic copy of the consent form through email for their review prior to the interview. Because the interviews were conducted by telephone, participants were read the informed consent form and gave verbal consent, except in cases where drivers had access to the ability to sign and return the consent form electronically. To ensure confidentiality, interviews were only be conducted by the lead researcher. Confidentiality was also be maintained by storing the data on a password-protected database. Finally, drivers were given the option of providing an alias to further protect their anonymity.

Participants were identified using three means: (a) contact with a key informant, who served as a gatekeeper; (b) a social networking website (Facebook), which allowed researchers to tap into groups of truck drivers dedicated to physical activity and nutrition; and (c) a snowball sampling technique, by asking participants at the conclusion of their interviews whether they were aware of any other drivers who fit the criteria for inclusion in this study. Participants were

selected using purposeful maximum sampling, which is considered to be the most effective strategy for selecting participants for studies which involve in-depth qualitative interviews (Creswell, 2013; Seidman, 1991). This was appropriate for exploring the phenomenon under investigation in this study, as generalizability is not an objective in qualitative studies (Creswell, 2013).

Data were collected through in-depth interviews, with an average interview duration of approximately 2 hours. Participant interviews were engaged through a semi-structured interview guide, which included questions designed to enhance understanding of settings-level influences on health behavior (see Table 1).

### Data Analysis

Analysis followed a modification of the method advanced by Moustakas (1994). First, using the transcripts from each interview, every expression relevant to the experience was listed. Second, the process of reduction and elimination was employed, and key statements were identified. Codes, or "meanings," were then derived from each key statement, with the help of a second coder. Key statements were then clustered into themes using their meanings, and subthemes were then identified within each of the thematic clusters.

### Trustworthiness

Four techniques were employed in this study to ensure trustworthiness in data analysis by guaranteeing reflexivity and countering bias. Bracketing involved clarifying research bias from the beginning of the study and enacting ongoing measures throughout the course of data collection and analysis. Note-taking and memoing documented judgments, interpretations, biases, and assumptions of the researcher in vivo during and after interviews. Intercoder agreement was used by employing four second coders: One second coder per interview reviewed and developed meanings independently from the key statements, blind to the meanings developed by the lead researcher; and second coder and lead researcher then convened and developed consensus meanings for each key statement. Finally, after data analysis and interpretation, the process of member checking was employed, where the researcher solicits feedback from participants regarding the credibility of the findings and interpretations reached (Creswell, 2013), including evaluation of the essential, invariant structure.

### Results

The first theme was labeled *access to health resources*. Meanings included in this theme were oriented around resources that are available to drivers who had been healthy over a sustained period of time and were considered valuable as they sought to engage in health-supportive behaviors.

**Table 1.** Semi-Structured Interview Guide.

Question	Probe
1. What do you do to be healthy while working as a driver?	<p>How do you go about achieving a balanced, healthy diet while on the road?</p> <ol style="list-style-type: none"> <li>General eating patterns</li> <li>Fruit and vegetable consumption</li> <li>Limiting fat intake</li> <li>Achieving a balanced diet</li> </ol> <p>How do you find opportunities for physical activity?</p> <ol style="list-style-type: none"> <li>Regular/everyday physical activity</li> <li>How often and for how long</li> <li>What types of physical activity</li> </ol>
2. What challenges do you face which may make it difficult to stay healthy while on the road?	
3. What, if anything, do you think makes drivers who are able to live healthy while on the road different from drivers who are not able to live healthy while on the road?	
4. What is the hardest thing about staying healthy as a truck driver?	
5. How influential do you feel that everyday places you visit while on the road (truck stops, warehouses, company-operated terminals, rest areas, truck cabs) are in the health of truck drivers	
6. What should be changed in everyday places you visit while on the road to make it easier to stay healthy?	<p>How could these places help drivers to eat healthy?</p> <ol style="list-style-type: none"> <li>Truck stops</li> <li>Truck cabs</li> <li>Rest areas</li> <li>Warehouses</li> <li>Company-operated terminals</li> <li>Company facilities</li> </ol> <p>How could these places make it easier for drivers to get more exercise?</p> <ol style="list-style-type: none"> <li>Truck stops</li> <li>Truck cabs</li> <li>Rest areas</li> <li>Warehouses</li> <li>Company-operated terminals</li> <li>Company facilities</li> </ol>
7. Overall, how do you feel that your career as a truck driver has affected your ability to be healthy?	

These resources include those available in or near the settings that are most commonly visited by drivers, particularly truck stops:

We are actually working with these restaurants who actually bring more healthy food into the menus. Letting them know they need to advertise it. Right now you'll see a lot of the basic food that truck drivers like to eat—chicken fried steak, blah blah blah. That's what they want, but if you look at their menus you'll see the other offerings on them.

Regarding resources for exercise, participants cited how one truck stop chain “has bent over backward,” how they “are doing a great job,” and “it is amazing to see that.” Outside of immediate workplace settings, drivers described using alternate means of transportation to access resources; for example,

The truck has helped me to get to places that I would not otherwise be able to get to. I've ridden trails to where if I only worked in Dallas, only in the DFW area, I never would have

ridden through . . . I never would have ridden these obscure trails that I've read about.

Other resources included being able to take advantage of job characteristics, technology, available time, and flexibility.

The second theme was labeled *barriers to health behaviors*. Meanings included in this theme reflected the challenges and barriers that drivers perceive as they seek to engage in health-supportive behaviors, such as the inherent sedentariness of their occupation and the abundance of unhealthy food available in their workplace settings. These barriers include those available in or near the settings that are most commonly visited by drivers. One major barrier related to accessing healthy food, as one driver described how, “Right where the salads are, right above it, are huge slices of pizza . . . When you get a sale on two slices of pizza, you are going to grab that instead of the four dollar salad that's below it.” Another major barrier related to accessing exercise:



They're [truck stop gyms] rudimentary and they're basically just so they can say they have a gym. And they won't take care of them, and then you'll walk in one day and it will be all worn down and pretty ratty.

Time management was an additional major barrier: For example, one driver mentioned how "[Hours-of-service] adds on to the complication . . . Mandating how you spend your day doesn't, to me, help with the flexibility you need to exercise when it works out best." Other major barriers related to company/job characteristics, individual characteristics, and the overall trucking culture.

The third theme was labeled *recommended alternative settings*. Meanings included in this theme reflected changes, such as workout facilities at company-operated terminals and factory-installed appliances in truck cabs that drivers support across various settings as they seek to engage in health-supportive behaviors. The settings which drivers suggested changes for were truck stops, truck cabs, company-operated terminals, warehouses, rest areas, trucking companies; also, there were suggestions as to how drivers as a group should catalyze change in these settings. Many of these suggestions were considered to be "win-win[s] for the company and driver for the company to promote exercise and healthy living on the road." Many suggestions were pragmatic; for example, "[Truck stops] can have maps with walking trails . . . It wouldn't cost much money for them to put that on the wall and maybe it would inspire a culture," and, "More trucks can have a factory-installed refrigerator/freezer and a power inverter for powering up a microwave. That would be a major difference so a driver can carry his own food with him."

The fourth theme was labeled *constituents of health behavior*. Meanings included in this theme consist of important elements and factors in engaging in health-supportive behaviors, such as the impacts of job stress on food purchasing decisions and the importance of making small changes in improving one's overall health. These meanings were not necessarily tied to specific settings; rather, they were general beliefs regarding important elements in factors in engaging in these behaviors. For example, social support was important: One driver stated how, "I'm the old, technologically inept guy. I've learned from the younger drivers about how to do things. It's like, 'Wow, that's a cool idea.'" Healthy food was also an important constituent:

I had to recognize what made me want to grab a doughnut, so I had to recognize the stress and the triggers. "Well, I'm mad because my load got cancelled." So I used to grab a doughnut and start eating. But now if I grab an apple or something crunchy, I can fight that feeling. Or if I get out and go for a walk or something.

Exercise was another important constituent, with drivers describing how, "I have to fit in some exercise somewhere," "You've got to get out there and do it," and "You have to

make time." Additional important constituents of health behavior were related to overall health, stress avoidance, and time/fatigue management.

The fifth theme was labeled *motivation for health behaviors*. Meanings included in this theme consist of sources of motivation for drivers as they sustain health-supportive behaviors, such as drivers' families. The important sources of motivation for health behavior were social networks, enjoyment of healthy behaviors, perspective on health, benefits of healthy behaviors, internal motivation, pursuit of goals, cues for health behaviors, stress relief, and regulatory pressures. Drivers reflected on motivation coming from fellow drivers:

I might come into a truck stop running, and I've had people clap as I come into truck stops. And sometimes they think it's cool that a guy's running, and they'll come over and talk to you.

Another source of motivation came from their employers, as described by one driver:

To be honest with you, before [my former partner] passed away I wasn't sure if I even liked [my dispatcher]. What happened is, when she was sick with cancer for 14 months, they let me work locally. [My dispatcher] was there for me when [my former partner] passed away. I think he saw that I needed comfort in my life to keep me motivated. He made a tremendous impact in my life.

The sixth theme was labeled *attitude toward health behaviors*. Meanings included in this theme consist of critical aspects of attitudes that enable health-supportive behaviors. One meaning was individual responsibility:

Nobody can do it for you. Because, believe me, people told me for a lot of years that I needed to do something. And I said, "Okay, just as soon as I'm done eating." Until I was standing in a store wondering what cane I could buy and still look like I could do my job anymore. That's a pretty drastic wake-up call, and literally that's where I was at . . . wondering, because I couldn't walk anymore. So it was like, "This is stupid. I've got to do something different." So I started the process.

Positivity and a general healthy approach were additional meanings. One driver noted, "If you want to make it not work, you can do that . . . but if you want to make it work you can . . . it's just your attitude." Another driver expressed how:

Many drivers that we see are victims, and they're down all the time. They don't see the good. They're always looking at the bad. So I think that's one of the hardest things out here is getting to feel good about what they're doing and themselves.

The seventh theme was labeled *trucking culture*. Meanings included personal health impacts of being employed as a truck driver, and the broader culture of the trucking industry:

I would probably be more healthy [in a different career]. If I was working a regular job in an office and I wasn't driving a truck I would probably find more time to ride my bike and go to the gym on a regular basis.

The important aspects of the culture of the trucking industry for health behaviors are related to individual impacts of employment as a truck driver, the broader culture, general driver characteristics, transition to a healthier culture, and the health culture in the past. Optimism regarding the trajectory of the trucking industry varied; for instance, one driver stated,

Like anything else, when people shift to do things in healthy ways they usually make a lot of mistakes. I think the truck stops about 10 years ago, they were pushing for healthy stuff. But for one thing, it wasn't all that healthy, and nobody really cared. Well, the timing was bad, and I think those things take time, and it's getting better.

While another reflected,

Back in the day, before regulation, a lot of drivers did their own work. They were loading and unloading their own equipment. Now it's more of a sedentary job. You're basically sitting in your truck waiting for someone to unload you.

### *Essential, Invariant Structure*

The experience of being a healthy driver varies greatly for each individual, consisting of a complex and unique set of resources and challenges that unfold in countless and ever-changing settings. Barriers exist in nearly every setting drivers visit, including truck stops, company-operated terminals, warehouses, rest areas, and even their own truck cabs. Broader barriers which make it difficult to lead a healthy lifestyle, including those related to job and company characteristics, time management, individual personality attributes, and the overall culture of the trucking industry, all combine to lead many drivers through a vicious cycle of unhealthy decisions perpetuating more unhealthy decisions.

As a driver, being able to consistently engage in health-supportive behaviors means making use of the resources available on the road. These resources are found in multiple settings, including but not limited to truck stops, company-operated terminals, warehouses, rest areas, and truck cabs, as well as through companies or job characteristics. Being healthy on the road also often means thinking about "settings" differently—healthy drivers are able to escape the bounds of traditional truck driver settings and find ways to access resources in additional settings. Nearby neighborhoods, trails, grocery stores, restaurants, and gyms are among the settings that healthy drivers take advantage of that many other drivers may not be cognizant of or have not taken the steps to use them. Healthy drivers have unique insight into meaningful ways that settings can be changed to better support healthy behaviors by providing resources and removing barriers.

Adaptation and flexibility are essential elements in living healthy on the road because of the unique barriers and limitations on resources endemic to the trucking profession. Healthy drivers tend to have a number of personal characteristics which enable them to thrive while others struggle. Taking control of one's own health through having a profound sense of personal responsibility, maintaining a positive attitude toward health behaviors, prioritizing health, and being able to improvise ways to access and use resources all help to enable health behaviors. Multiple, inspirational sources of motivation, often working simultaneously and from several sources, are critical in perpetuating healthy behaviors as well, as being a healthy driver is a constant struggle for most.

Within the broader culture of the trucking industry, where being sedentary is the norm and physical activity and healthy eating are still stigmatized, taking full advantage of all possible resources, both external and internal, helps drivers to maintain their health. Healthy drivers take pride in their ability to motivate others, overcome challenges, be innovators, and be trendsetters within an overall optimism that the culture of the trucking industry is shifting toward supporting and prioritizing the health and well-being of its drivers.

## **Discussion**

Truck driving has been described as an "obesogenic" occupation, and obesity and other health indicators indicate that this is indeed the case (Apostolopoulos et al., 2010). Data gathered in the current study suggest that unhealthy behaviors are the default behaviors for individuals in this occupation and have to be constantly resisted, even by those drivers who are consistently living a healthy lifestyle:

I don't think it's a choice to be unhealthy as much as it is a choice to be healthy. You don't make a choice, "Geez, I'm going to go out and eat and get fat and just make my life miserable."

Such unhealthy behaviors were viewed as a "vicious cycle":

The more unhealthy you are . . . it has the tendency to change your state of mind. It gives you more of a negative [outlook]. It's a vicious cycle . . . you're miserable, so you eat, and you get in the truck, and you don't feel like getting out, so you eat some more.

Health promotion efforts thus are critical to reverse worsening trends in driver health outcomes. Such efforts can effectively be guided by ecological models of health behavior and settings approaches to maximize their likelihood of success.

### *Ecological Models of Health Behavior*

Ecological models of health behavior attempt to understand health behaviors by taking an ecological perspective and are

based on the idea of multi-level influences on health behaviors, including the intrapersonal, interpersonal, organizational, community, physical, environmental, and policy levels, as they guide comprehensive interventions (Peirson, Boydell, Ferguson, & Ferris, 2011; Sallis, Owen, & Fisher, 2008). Given the complexity and diversity of factors identified as relevant to driver health by healthy drivers, applying such models in health promotion efforts seems appropriate.

Apostolopoulos, Sonmez, Shattell, and Belzer's (2011) Ecological Conceptual Framework of Trucking Obesity is particularly valid for guiding health promotion efforts in the context of the current study. This model consists of seven sets of variables: (a) sociocultural context, (b) transportation environment, (c) individual and background factors, (d) physical activity determinants, (e) diet behavior determinants, (f) genetics, and (g) outcomes. These variables influence driver health outcomes related to obesity (Apostolopoulos, Sonmez, Shattell, & Belzer, 2011).

Components of the sociocultural context—food supply trends, nutrition and eating-out trends, and food marketing and pricing trends—emerged powerfully across a number of themes with these healthy drivers. Physical activity determinants were salient to participants as well, as drivers talked a great deal about engagement in physical activity within truck stop, truck cab, terminal, warehouse, and rest area settings. They described these settings along several dimensions, such as accessibility, quality, maintenance, variety, sanitation, and information.

The articulation of transportation environment variables are where the Ecological Framework of Trucking Obesity is especially powerful, as these variables constitute much of what makes the truck driving profession unique. Professional drivers operate in a highly regulated and increasingly regulated environment, including government regulations, trucking operations, corporate policies in truck driver settings, and the built environment, with all of these being reflected in the current study. Drivers spoke about all four components.

The Ecological Conceptual Framework of Trucking Obesity is the most comprehensive ecological model of health behavior for truck drivers; however, in the context of the present findings, additional components are recommended for inclusion. First, the role of technology appears to be of particular importance to the drivers, impacting access to resources and motivation. Recent technological advances were mentioned repeatedly by these participants, stating that this technology “kicks ass” and that “the Internet makes [finding opportunities for exercise] just a cinch these days.” Other components that should be implemented into the Ecological Conceptual Framework of Trucking Obesity relate to motivational and attitudinal factors. These healthy drivers cited multiple, often co-occurring and overlapping, sources of motivation that drove engagement in healthy behaviors. Attitudinal factors that especially powerful to these participants as well, particularly individual responsibility and positivity.

## *Settings Approaches to Health Promotion*

The basic premise in ecological models of health behavior is that efforts to change individuals' behavior cannot be effective if environments make it difficult (Sallis et al., 2008). The settings approach has become increasingly common in health promotion due to ecological approaches (Green, Poland, & Rootman, 2000) based on the understanding that determinants of health extend beyond individual lifestyle and health services factors, with social, economic, organizational, environmental, and cultural factors all determinants in health (Dooris, 2012). As an intervention strategy, alternative settings can be created to fill needs that are not met by existing organizations, often maintaining their distinctiveness over time (Cherniss & Deegan, 2000). Many of these healthy drivers identified leverage points which could advance driver health. Taking advantage to low-cost leverage points can make meaningful positive impacts in the ability of drivers to access resources and overcome barriers to engaging in health-supportive behaviors.

Leverage points across more distal levels of influence were identified by participants as well. Participants discussed how truck stops companies, company-operated terminals, trucking companies, and even the FMCSA are open to hearing recommendations and are more conscious of driver health issues than ever before. For example, one driver described how Anne Ferro, Administrator of FMCSA, has been “very open,” and how, “if you talk to her, she's been very willing to listen. She's very conscious of the health issues.” Ultimately, the various settings that constitute the transportation environment as a whole need to be modified to create the magnitude of change necessary for this disproportionately burdened population (Apostolopoulos, Sonmez, Shattell, & Belzer, 2011).

## *Study Limitations*

One limitation relates to the increasing diversity of the truck driver population. While generalizability was not a goal of this research, it is possible that other drivers in different contexts may have divergent experiences. Another limitation relates to the diversity of the transportation and material moving sector. This particular study focused on long-haul truck drivers, who represent only a fraction of the trucking industry. In addition, the trucking settings in which drivers operate are constantly in flux; thus, this study only represents a “snap shot” in time.

## *Implications of Findings for Theory Development and Policy*

Findings of this study revealed a wide diversity of driver perceptions in factors that were considered relevant, both in whether they considered a factor to be a barrier or a resource, and in how they individually responded to the factor. Thus,



the determinants of driver health are complex; therefore, health promotion efforts in the trucking industry need to account for the complexity and uniqueness of the trucking environment to be effective and sustainable (Apostolopoulos, Sonmez, Shattell, & Belzer, 2011). Current assumptions of many approaches to intervening in driver health underestimate the complexity of the root causes of driver health, as most occupational health issues function as complex and adaptive nonlinear dynamic systems; hence, the interventions generated under the auspices of these assumptions only generate underwhelming and unsustainable impacts on driver health (Apostolopoulos et al., 2014; Lemke & Apostolopoulos, 2015). A new paradigm to understanding and intervening in driver health, the Integrative and Dynamic Healthy Commercial Driving (IDHCD) paradigm, provides a theoretical framework that embraces this complexity, with the potential to change policy and health behavior significantly.

The new paradigm is based on three mechanisms. The first is the integration of intervention and prevention measures of the primary, secondary, and tertiary types (Apostolopoulos et al., 2014; Lemke & Apostolopoulos, 2015). The second mechanism is an inclusive mental framework that incorporates multiple, multi-level, complex, and interacting components, emphasizing upstream domains as root causes, influencing not just truckers, but the transportation sector and the general population (Apostolopoulos et al., 2014; Lemke & Apostolopoulos, 2015). The third mechanism of this paradigm is inclusion of multiple key stakeholders, across multiple levels of influence, with an understanding that consensus among them leads to increased synergies and improved outcomes (Apostolopoulos et al., 2014; Lemke & Apostolopoulos, 2015).

The IDHCD paradigm involves the development of causal-loop-diagrams, which are models of systems that are simplified representations of parts of reality (Homer & Hirsch, 2006). The resulting causal loop diagram is then translated into stocks-and-flows diagrams and differential and algebraic equations, which then become the basis for simulation models (Sweeney & Sterman, 2000). Simulation models allow for a more accurate prediction of the effects of interventions in the dynamic and complex environments in which they are implemented, where pathways between intervention and outcomes may be delayed, indirect, or possibly affected by nonlinearities (Levy et al., 2011). Simulation testing allows for an increased understanding of how health trajectories may change under different configurations of driver health and wellness initiatives (Apostolopoulos et al., 2014; Lemke & Apostolopoulos, 2015).

The IDHCD paradigm could shift policy to better support driver health. This paradigm could translate to improved health and wellness initiatives. Furthermore, trucking companies that would like to address driver health, but do not know what to do with limited resources, could develop a simulation model that would allow for testing of the most

impactful way to address driver health within those limited resources. These models could also be used to improve or expand existing health and wellness programs in the most effective and efficacious way possible.

## Conclusion

This transcendental phenomenology found a diverse set of factors affecting commercial driver health outcomes. Seven broad themes were identified: access to health resources, barriers to health behaviors, recommended alternative settings, constituents of health behavior, motivation for health behaviors, attitude toward health behaviors, and trucking culture. Lessons learned from these drivers suggest holistic approaches, such as applying ecological theories of health behavior and settings approaches, would be most effective in improving driver health. We propose the IDHCD paradigm, grounded in complexity science, as a new theoretical framework for improving driver health outcomes holistically.

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