

Reducing Chemical Footprints in the Front Range

University of Colorado Denver School of Public Affairs

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Executive Summary

This project was conducted to help the Institute for Environmental Solutions (IES) better engage with individuals living in the Front Range and encourage them to reduce their use of household products containing Contaminants of Emerging Concern (CECs). While IES has

started a Community Based Social Marketing (CBSM) effort to achieve this goal, they have had difficulty engaging the community.

The project had four research questions: RQ1) who is the target audience for reducing chemical footprints?; RQ2) what engagement barriers does IES faces with the target audience?; RQ3) what strategies can be implemented to overcome these barriers?; and RQ4) what type of organizations would be best suited for IES to partner with?

To answer these four research questions, the project employed two research methods. First, secondary research was utilized to identify a target audience. Second, semi-structured phone interviews were conducted with both the target audience and potential partners. Secondary research identified both college educated individuals and parents as IES' preferred target audience. The phone interviews revealed that the target audience lacked knowledge of CECs, they had significant time constraints, and whether they were interest level in the specific CBSM effort. The interviews also uncovered that utilizing convenient in-person interactions and word-of-mouth through the target audiences' social networks could overcome the identified engagement barriers. Additionally, partnering with trusted local businesses would best suit IES.

Finally, the project provides policy recommendations for both current and post COVID-19 pandemic. During the pandemic, IES should emphasize social diffusion through the target audiences' social networks and initiate formalizing virtual projects with local businesses. After the pandemic, IES should set up booths at weekend markets for one-on-one efforts.

Introduction

Water quality in Colorado poses a significant public policy concern that will continue to worsen as climate change reshapes the landscape (Denver Water, n.d.). In 2019, the

Environmental Protection Agency (EPA) awarded over a million dollars to the Colorado Department of Health and Environment to improve water quality in the lower Arkansas and lower Gunnison river basins (EPA, 2019). This grant is part of a \$165 million effort to improve water quality standards by reducing nonpoint runoff throughout the United States (EPA, 2019). According to the EPA, nonpoint runoff pollution is the leading cause of water contamination which includes nitrates from plants and animals, pathogens from animal waste, and contaminants of emerging concern (EPA, n.d.).

Contaminants of emerging concern (CEC) are harmful chemicals found in common household products, such as personal care (shampoo, soap, skin lotion, insect repellent), gardening products, and cleaning supplies (IES, 2018). After individuals utilize products containing CECs, the chemicals pass untreated through wastewater treatment facilities and flow into groundwater, rivers, and watersheds. CECs include the carcinogenic compounds and endocrine disrupters triclosan, parabens, surfactants, synthetic fragrances, DEET, bisphenol-A (BPA), alkylphenols, and oxybenzone (IES, 2018).

Many CECs cause serious defects in wildlife and can disrupt hormonal functions in humans (Downs et al., 2015; Department of Toxic Substance Control, n.d.). For instance, oxybenzone reduces coral reefs' ability to counter the effects of increased global temperatures and warming ocean temperatures (Downs et al., 2015). Despite the dangers posed by CECs, the United States generally fails to regulate them, and most water treatment facilities do not have the capacity to remove CECs from the water supply (IES, 2018). Therefore, preventing CECs from entering the water supply is important.

Institute for Environmental Solutions

Founded in 2004, the Institute for Environmental Solutions (IES) is a Denver-based nonprofit organization whose mission is “to deliver scientific solutions to improve our health and environment” (IES, 2018). One-way IES fulfills its mission is through the Chemical Footprint (CFP) Project. The CFP project focuses on reducing the use of hazardous chemicals to prevent water pollution and protect the health of humans and the environment (IES, 2018). The CFP project’s goals include:

- Foster commitment to reduce the use of personal care, food, and household products containing CECs.
- Identify safe and effective alternatives to products containing CECs.
- Show children and adults how to reduce their chemical footprints.
- Demonstrate that prevention of trace contaminants in water is cheaper and more effective than treatment.
- Expand and improve outreach and communication about CECs.
- Increase knowledge and resources about reducing chemical footprints. (IES, 2018)

The CFP project has adopted the community-based social marketing (CBSM) strategy to encourage people to reduce their chemical footprint by avoiding purchasing products containing CECs, reducing the use of CEC products, and making their own Do-it-Yourself (DIY) products free of CECs (IES, 2018). IES conducted both qualitative and quantitative studies in order to ascertain any potential barriers preventing people from adopting more environmentally friendly habits. IES found three key factors/barriers keeping individuals from purchasing environmentally friendly products: availability, high cost, and effectiveness (IES, 2018).

From the data collected the IES CFP project created workshops and training materials that focused on encouraging reducing chemical footprints. Despite these efforts, IES has had difficulty engaging the local community regarding this issue.

Capstone Project’s Purpose

The project's purpose is to bolster IES's previous social marketing efforts in adopting effective strategies to encourage individuals to reduce their chemical footprint. Specifically, this project seeks to identify: 1) who IES should target for a community-based social marketing program to reduce chemical footprints; 2) potential barriers towards engaging this target audience; 3) strategies for overcoming these barriers; and 4) types of organizations IES can partner with. Additionally, a long-term goal of this project is to create opportunities for local politicians to put CEC prevention on their policy agendas.

This project first examined the literature on effective social marketing efforts and how these efforts can improve the policymaking process. Then, this project interviewed individuals concerned about local environmental issues and analyzed barriers to engagement with local communities' members. Finally, this project discusses the results of the data collected before concluding with policy recommendations for IES to pursue.

Literature Review

This literature review connects a variety of topics related to encouraging reducing chemical footprints. The literature review explores: 1) social marketing's role in public administration, 2) social marketing's background, 3) lessons learned from past social marketing efforts, and 4) frameworks for cross-collaborative partnerships.

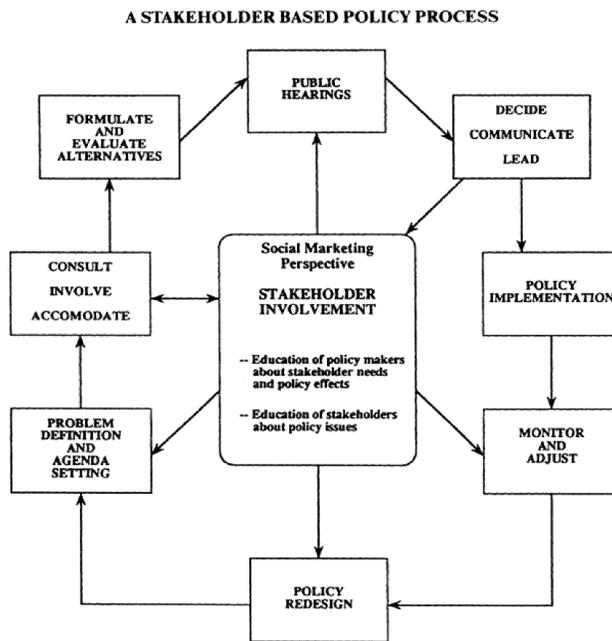
Social Marketing's Role in Public Administration

Social marketing is a way to utilize traditional marketing techniques to achieve a social good and promote sustainable behaviors (McKenzie-Mohr, 2011). Social marketing is a practical

tool for both public administrators and nongovernment organizations to enhance the policy process. Yet, the academic literature is lacking in the role social marketing plays in public administration despite its applicability to the field. One of the few frameworks that has gained attention is the stakeholder-based policy process (Altman & Petkus, 1994).

Altman and Petkus' (1994) stakeholder-based policy process framework theorizes that social marketing influences the policymaking process by increasing stakeholder involvement. Altman and Petkus (1994) suggest social marketing can impact five steps of the policy process: 1) defining the problem and agenda-setting; 2) consulting, involving, and accommodating stakeholders; 3) gaining interest in attending public hearings; 4) monitoring and adjusting public hearings; and 5) helping with policy redesign. Figure 1, below, shows how social marketing plays a central role in public administration.

*Figure SEQ Figure * ARABIC 1. Stakeholder Based Policy Process Framework (Altman & Petkus, 1994).*



This project
defining the

fits squarely into
problem and

agenda-setting aspect of Altman and Petkus' (1994) framework. Altman and Petkus (1994) states

as the public becomes increasingly aware and concerned about an environmental issue through a social marketing effort, public administrators are more likely to place the issue on the policy agenda. Therefore, nonprofits such as IES can influence local policy agendas through a social marketing effort.

Social Marketing Background

For decades researchers have been exploring why people adopt—or fail to adopt—environmentally friendly habits (Kollmuss & Agyeman, 2002). Researchers have found a significant gap between individuals’ knowledge of an environmental problem and their willingness to change their behaviors (Kollmuss & Agyeman, 2002). Researchers concluded that mere knowledge is not enough to motivate people to adopt socially responsible behaviors (McKenzie-Mohr, 2000). McKenzie-Mohr (2000) states that researchers need to apply psychological behavior strategies to their marketing efforts. Enter social marketing.

Social marketing has been used to encourage a variety of beneficial societal behaviors to help with public health concerns and environmental issues. The term was first created by Kotler and Zaltman (1971); however, the most referenced definition was developed by Andreasen (1994) who defines social marketing as “the adaption of commercial marketing technologies to programs designed to influence voluntary behavior of target audiences to improve their personal welfare and that of the society that they are a part” (p. 110).

Social marketing was first developed by applying the “4 Ps” of the marketing mix model (price, product, promotion, place) to social issues (Grier & Bryant, 2005). Early efforts relied heavily on educating the target audience while describing the desired behavior change (Kennedy, 2010). As research progressed, the framework developed additional criteria. Grier and Bryant

(2005) found all social marketing frameworks include “exchange theory, audience segmentation, competition, ‘the marketing mix’, consumer orientation, and continuous monitoring” (p. 321).

Community-based Social Marketing

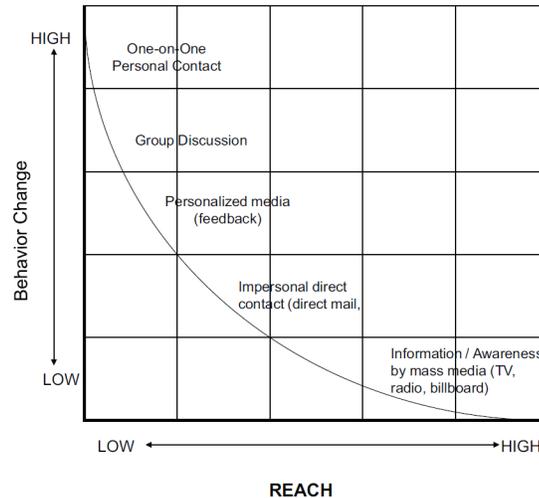
McKenzie-Mohr (2002) argues education efforts have been ineffective in creating desired behavior change. He developed a Community-based social marketing (CBSM) framework, which combines social marketing principles with social psychology (McKenzie-Mohr, 2002).

McKenzie-Mohr (2011) argues the most successful social marketing efforts focus on identifying barriers to the desired behaviors, finding solutions to remove the barriers, and creating barriers to the undesired behavior.

McKenzie-Mohr’s (2011) CBSM framework is meant as a practical guide for implementing a social marketing effort; however, he fails to provide in-depth insights into the critical elements every effective social marketing effort requires. For instance, all social marketing, including CBSM, is derived from traditional marketing principles. A cornerstone of traditional marketing principles is the necessity to segment the target audience from the general population in order to address their specific needs and barriers. While McKenzie-Mohr (2011) acknowledges the need to understand information on a target market’s attitudes, beliefs, and behaviors, he fails to mention this is a critical element for any effective CBSM effort.

Additionally, McKenzie-Mohr (2011) fails to mention that understanding how you reach your target audience can play a critical role in the effectiveness of behavior change. Researchers have found that the more intimate the communication, the greater chance there will be a change in behavior (Schultz, 2010). Figure 2, below, shows how effective different communication methods are for changing behaviors.

Figure 2. Effectiveness of Communication Methods (Schultz, 2010).



Additionally, case studies have explored various social marketing efforts and can offer insights into CBSM’s strengths and weaknesses that alludes McKenzie-Mohr’s (2011) general CBSM framework.

Lessons Learned from Social Marketing Case Studies

Case studies on various social marketing found several critical elements needed for a successful CBSM effort. The below section details lessons learned from previous social marketing efforts. Specifically: 1) understanding the target audience, 2) knowing how to engage the target audience, and 3) gaining an understanding of the target audience’s social network.

Target Audience

The first critical element for an effective social marketing effort is knowing your target audience. Pfeiffer (2004) analyzed a social marketing effort in Mozambique that was designed to help prevent the spread of HIV. A non-government organization (NGO) developed an educational effort promoting condom use for Africans but did not develop an effort specifically for Mozambicans. Pfeiffer (2004) found that a critical mistake the NGO made was not taking

into account the local residents' beliefs and behaviors. The effort was seen by locals as endorsing promiscuous behavior. The NGO failed to take into account the recent increase in religious activities within certain communities that promoted an abstinence-only ideology (Pfeiffer, 2004).

Engaging Target Audience

A second critical element for an effective social marketing effort is understanding what engagement barriers an organization faces with its target audience. McKenzie-Mohr (2011) states that, without gaining the attention of those you wish to persuade, you cannot effectively change behaviors. Practitioners have found that the more intimate the communication, the more likely behavior change can be achieved (McKenzie-Mohr, 2011; Schultz, 2010).

For instance, Pfeiffer (2004) found that another significant issue with the Mozambique effort was the failure to strategize how the information should be presented to residents. The NGO had purchased radio advertisements, which aired during the day when families were gathered together. The ads unsettled many individuals as these topics were generally not discussed around children (Pfeiffer, 2004).

Another study by Withall, Jago, and Fox (2012) measured the effectiveness of a social marketing effort for a fitness program in the United Kingdom for underserved neighborhoods. The researchers compared the how social marketing efforts in certain neighborhoods affected participation in a fitness program compared to other neighborhoods. The neighborhoods that were targeted for the social marketing effort had better recruitment, attendance, and adherence to the fitness programs. The researchers hypothesized that success was due to the target audience being exposed to the social marketing effort multiple times (Withall, Jago, & Fox, 2012).

Additionally, engaging the target audience in interpersonal interactions has been shown to increase the effectiveness of a social marketing effort. Research has shown that direct appeals to the target audience are one of the most effective ways to change behaviors (McKenzie-Mohr, 2011). For instance, Haldeman and Turner (2009) implemented a CBSM effort to increase recycling in Maryland. The researchers developed a pilot program where they initiated direct contact with the target audience while providing recycling bins. The effort initially increased recycling by 68%. Haldeman and Turner (2009) found that discussing the issue directly with neighbors played a key role in the increase.

Social Networks

A third critical element for an effective social marketing effort is understanding the social networks of the target audience. In order to change behaviors on a large scale, social marketing efforts rely on social diffusion. Dodd and Winthrop (1953) defined social diffusion as “the growth and spread, from person to person, of a one-way change of behavior” (p. 182). A community’s social networks are a key element in creating social diffusion.

Withall, Jago, and Fox (2012) found that participants communicating through their social networks was an important element in creating a social norm. Specifically, the researchers believed word-of-mouth between residents was the most effective way the fitness classes were promoted. In Mozambique, Pfeiffer (2004) found that NGOs not involved with the original social marketing effort were able to counter the failures by having extensive contact within the local churches, which had a significant influence on behaviors and norms of the local population.

Cross-sector collaboration

Another tool practitioners utilize to help encourage behavior changes through a social marketing effort are partnerships with community organizations such as local business or nonprofits. Cross-sector collaborations are ventures between various community stakeholders such as government agencies, businesses, nonprofits, and the public. (Bryson et al., 2006). Collaborations are necessary for addressing complex policy issues such as reducing individuals' chemical footprints (Page et al., 2015).

In order for a cross-collaboration to be effective, certain initial conditions need to be present. Specifically, the literature has found three initial conditions: 1) there needs to be proper environmental factors, 2) a sector failure, and 3) direct antecedents of collaboration formation between the parties (Bryson et al., 2006). Proper environmental factors relate to the driving forces that cause a need for a partnership in the first place, such as an inability to remove CECs from the water supply. Sector failure is when efforts by a single organization have failed to overcome the environmental factors and achieve the preferred outcome. Finally, direct antecedents of collaboration formation include general agreements about a policy issue—and how to address the issue—concerning both parties (Bryson et al., 2006).

Additionally, trustworthiness between the partners is an important element (Bryson et al., 2006). Trust is generally established when there has been a prior collaborations. If there is no prior relationship, then researchers have found that small informal deals will have the most success (Bryson et al., 2006). Small informal deals are any interactions towards a common goal where trust is not a major factor and there is little risk to either organization (Ring & van de Ven, 1994). Trust is paramount for complex cross-collaborative partnerships and small informal deals allow trust to be built amongst partners (Gulati, 1995).

Methodology

This study will answer four research questions: RQ1) Who should IES target for a CBSM effort?; RQ2) What community engagement barriers does IES face in implementing an effective social marketing effort to its target audience?; RQ3) What strategies can IES initiate to overcome these barriers?; RQ4) What types of organizations would be best suited for IES to partner with or to host CFP workshops?

Two research methodologies were used to answer the research questions. First, secondary research was conducted to identify a target audience for IES's community-based social marketing strategy. Second, qualitative data was collected through semi-structured interviews from individuals who are the identified target audience and potential cross-collaborative partners. The project is exploratory in nature to gain in-depth information into who, when, where, and how IES can motivate individuals to reduce their chemical footprints.

Data Collection

Target Audience

Secondary research was conducted to determine the target audience for a social marketing effort promoting chemical footprint reduction. As described above in the literature, understanding your target audience is imperative for an effective social marketing effort. The secondary research was conducted by reviewing academic research papers and marketing strategies from businesses focused on environmentally friendly household products. Additionally, research shows that social marketing efforts require individuals to already support the effort's message (McKenzie-Mohr, 2010). Therefore, the target audience was limited to individuals who expressed concern for local environmental issues.

A Google Scholar search was conducted using the terms “consumer demographics likely to purchase green products”; “identifying potential green consumers”; and “green marketing”. The researchers reviewed over 20 academic papers and marketing strategies. Table 1, below, shows the sources used to determine the target market. The review consisted of looking at both academic papers and marketing strategies. The review of academic papers looked at both the literature review and conclusions of the studies.

Table 1. Target Audience Secondary Data Review

Name of Source	Authors	Date
Impact of education, age, newspapers, and television on environmental knowledge, concerns, and behaviors	Ostman, R. E., & Parker, J. L.	1987
Green buying: The influence of environmental concern on consumer behavior. <i>The Journal of Social Psychology</i> , 137(2), 189-204. doi:10.1080/00224549709595430	Mainieri, T., Barnett, E. G., Valdero, T. R., Unipan, J. B., & Oskamp, S.	1997
Targeting consumers who are willing to pay more for environmentally friendly products.	Laroche, M., Bergeron, J., & Barbaro-Forleo, G.	2001
Can socio-demographics still play a role in profiling green consumers? A review of the evidence and an empirical investigation.	Diamantopoulos et al.	2003
Beyond ecolabels: What green marketing can learn from conventional marketing.	Rex, E., & Baumann, H.	2007
The impact of parenthood on environmental attitudes and behaviour: A longitudinal investigation of the legacy hypothesis.	Thomas, G. O., Fisher, R., Whitmarsh, L., Milfont, T. L., & Poortinga, W.	2018
How I Built this with Guy Raz: Method	Casey Herman [producer]	2018

The Sustainable Business Case Book	Gittell, R., Magnusson, M., Merenda, M., & Open Textbook Library	2020
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Target Audience Interviews

Qualitative data was collected through semi-structured phone interviews to determine engagement barriers, solutions to the identified barriers, and potential partners for IES. Participants in these interviews fell into one of the target audience categories who were concerned about local environmental issues. A purposeful snowball sampling strategy was first utilized to identify individuals who met the descriptions of the identified target audience; however, due to a low response rate, a simple convenience sample was ultimately utilized. Convenience sampling strategy is a non-probability sampling technique and is utilized when participants are selected by their accessibility (Jager et al., 2017). The convenience sampling included acquaintances of the researcher, such as neighbors, and referrals from other contacts.

Target audience interviews were conducted from October 17th through November 12th. In total, six individuals were willing to be interviewed. All six had at least a college degree and three individuals were parents of children five years or younger. The interviews lasted between 15 and 25 minutes. Two of the participants were from out-of-state but lived-in areas where water quality was a serious issue, one of whom was the founder of a small nonprofit.

Even though the interviews were over the phone, the author was able to make a few observational field notes, specifically how parents were able to participate with their children around. After the interviews were concluded, the recordings were transcribed, reviewed for accuracy, and then deleted. All interviews had identifying information and most discussed medical issues related to environmental concerns. To ensure participants' privacy, confidentially,

and anonymity, the recordings were deleted and all sensitive and identifying information was redacted from the transcripts.

After transcription of all interviews, inductive content analysis was performed to find core themes within all the interviews. Inductive analysis is best utilized when trying to find out possible categories and themes (Patton, 2002).

Interviews with Potential Collaborative Partners

Semi-structured phone interviews were conducted between November 13th and 14th with two potential partners to gain better insights into which organizations would be best suited for IES: a board member of a Denver-based nonprofit and a manager of a fly-fishing shop. A convenience sampling technique was utilized. Due to the nature of the COVID-19 pandemic, convenience sampling was the most appropriate strategy, despite its limitations. As above, the recordings were transcribed, reviewed for accuracy, and then deleted.

Findings

Target Audience

The secondary research pointed to two demographics that IES should target for a community-based social marketing effort: 1) individuals with at least some college education, and 2) parents.

Some College Education

Individuals with some college education were identified as a market segment IES should focus a CBSM effort on. Three of the six studies reviewed pointed to education being a reliable demographic for individuals to adopt more environmentally friendly cleaning products. One of

those studies was a meta-analysis that had reviewed 136 studies and mentioned education as the most consistent demographic for individuals willing to adopt environmentally friendly products (Diamantopoulos, 2003).

Parents

The secondary research also pointed to parents as a potential target market for reducing chemical footprints. Past research has shown individuals are more likely worried about human behavior affecting the environment after they had kids (Laroche, Bergeron, & Barbaro-Forleo, 2001). While there has been at least one study that did not find a correlation between being a parent and adopting more environmentally friendly cleaning products (Thomas et al., 2018), businesses like Seventh Generation have heavily marketed to them (Gittell et al., 2020). Therefore, parents are a good demographic for a CBSM effort in reducing chemical footprints.

Barriers to Engagement

The content analysis of the interviews found three main barriers IES faces with engaging the target audience: 1) lack of knowledge of CECs, 2) time constraints, and 3) interest level. The first barrier identified was the participants' lack of knowledge of CEC's. Overall, no individual interviewed had heard the term Chemicals of Emerging Concerns. Most of the participants either recognized some CEC's such as DEET and BPA or knew of specific issues with a household product; but, they had little knowledge of the specific dangers CECs posed.

Second, all the individuals had mentioned time constraints as being a significant barrier engaging with a local nonprofit. Participants noted that they had limited amount of free time throughout their day. Most interviewees stated they would only be willing to commit to a one

time, 30-minute workshop to learn about local environmental issues. This is almost 2/3 less time than one of IES's current workshop formats.

Parents in particular mentioned the difficulties of spending a significant amount of time engaging with a local nonprofit when their kids were around. These difficulties were observed during the interviews with the parents being interrupted by their children or being in a different room while their significant other watched the children. Others mentioned their work schedule as being a contributing factor into how much time they would be willing to engage with a nonprofit.

Third, and finally, a major barrier to engagement is the target audiences' interest level in the CBSM effort. A broad theme that most participants mentioned was that any interaction had to be interesting. Two participants stated that they would be willing to spend more time engaging with a nonprofit if they were interested in the subject matter. One participant specifically stated that the time they were willing to commit was dependent on how entertaining the activity is.

Solutions to Overcome Barriers

The interview content analysis revealed two viable solutions to overcome the identified engagement barriers: 1) convenient in-person interactions, and 2) word-of-mouth through their social networks. First, all participants were more willing to engage with a nonprofit if the activity was convenient to their schedule. Four out of the six participants mentioned weekend markets as something that would fit into their schedule. One participant mentioned that they are much more open to discussing local environmental issues during a visit to a weekend market than other locations, especially if they had their kids with them. Others had mentioned the importance of workshops occurring when their work schedule permitted such as during their scheduled lunch break.

Second, most participants identified their social networks as playing a crucial role in overcoming the identified barriers either through in-person interactions or through social media platforms. Participants mentioned word-of-mouth, particularly from people they know and trust, to be one of the ways they decide to make behavior changes. For instance, one participant mentioned how they started gardening because they saw their friends' gardens and learned how it had a positive environmental impact..

One participant expressed how often they learned about local issues through social media parenting groups. Specifically, they stated how quickly issues involving health spread through word-of-mouth in social media parenting groups and they would be more willing to spread information themselves if they learned about it from these groups.

Potential Partners

The most important element the target audience interviews revealed for partnerships is that an organization needs to have a history of being concerned with environmental issues such as Patagonia and REI. Two participants specifically mentioned fly fishing shops as businesses they would trust to promote local water issues. Multiple participants expressed skepticism with any organization that promotes an environmentally friendly behavior that contradicts their past actions, such as Dupont promoting ways to reduce chemical footprints.

Additionally, the interview with a fly-fishing shop manager provided evidence that organizations who were concerned about the water quality would make good partners. The manager stated that they have worked with local environmental nonprofits in the past and the most successful projects involved a common concern of waste in the local rivers. The manager mentioned that they would be very interested in working with a nonprofit to help eliminate CECs

if the nonprofit could provide evidence on how CECs affect the health of fishes or the bugs the fish feed on.

Policy Recommendations and Limitations

Policy Recommendations

The policy recommendations are separated into two categories: 1) recommendations during the COVID-19 pandemic, and 2) recommendations for after the pandemic ends.

During Pandemic

There are two recommendations while the pandemic is still ongoing: 1) creating social diffusion through the target audience's social networks, and 2) start discussing small virtual projects with local businesses that are concerned about water quality.

Social Diffusion Through Social Networks

IES should utilize social media platforms to engage with community members about CECs and increase word-of-mouth throughout the target audiences' virtual social networks. The literature is clear that a major element to an effective CBSM effort is being able to penetrate the target market's social network and to utilize word-of-mouth strategies. For instance, the interviews revealed parents were concerned with the effectiveness and safety of environmentally friendly products and that they have learned about some products through parenting groups on Facebook.

To create social diffusion, IES can discuss the dangers posed by CECs and provide information on the effectiveness and safety of alternative products through parenting groups on social media. Several participants mentioned wanting to see research on the effectiveness of any

green product and they would trust the testimonies of people they know. Therefore, IES only needs to target a few individuals who are part of these social networks to create that diffusion.

Partnerships with Local Businesses

IES should work on small virtual projects with local and environmentally conscious businesses who are concerned about water quality. As the literature suggests, new partnerships are most effective when there are small informal projects that build trust among the parties. Promoting virtual projects will allow IES to start building long-term relationships with these local businesses. IES can parlay those efforts into future endeavors after the pandemic is over.

IES's attempts in reducing chemical footprints are well suited to meet all the initial conditions needed for effective cross-collaborative partnerships, as described in the literature above (environmental factors, sector failure, and direct antecedents (Bryson et al., 2006)). Reducing chemical footprints is a complex issue that IES has had difficulty getting community engagement and fly-fishing would seem particularly interested in eliminating CECs from water sources. In fact, some shops have information on their websites about their water conservation efforts (Trouts Fly Fishing, n.d.). IES should try to create small informal projects with fly fishing shops because they are both well suited to form cross-collaborative partnerships and the target audience would trust learning about CECs from them.

After Pandemic

After the pandemic, IES should explore setting up booths at weekend markets. Both the literature (Schultz, 2010) and interviews clearly show that the target audience prefers to have intimate face-to-face conversations regarding local environmental issues. One of the most consistent solutions identified in the interviews was interactions with the target audience at

weekend markets. The participants stated that they preferred to engage with a nonprofit during their own time and not feel committed to a workshop. Several interviewees stated that they have interacted with nonprofits in the past through weekend markets.

Additionally, a participant who operated a nonprofit stated that participation in an annual festival was the most effective way they have engaged with their target market. The participants found that individuals were more engaged and could have a “more real conversation” when a person talked to them during the festival.

Research has shown that farmers markets attract highly educated individuals who are generally more health and environmentally conscious (Byker, Shanks, Misyak, & Serrano, 2012). Researchers surveying individuals at farmers markets found over 50% of visitors had at least some college education (Byker, Shanks, Misyak, & Serrano, 2012.) This is the exact target audience and method of communication the literature suggests for a CBSM effort.

Furthermore, IES can adapt the CBSM tools they have developed for their workshops to weekend market booths. Most of the tools would easily be presented on an individual basis. A disadvantage of this approach is that the majority of individuals surveyed at farmers markets are upper middle-class and Caucasian (Elepua, Mazzocco, & Goldsmith, 2010). Part of IES’ initiatives is to help lower income communities. IES could counter this issue by targeting farmer markets near or in lower-income communities.

Limitations/

This project has three limitations: 1) lack of generalizability, 2) sampling issues, and 3) target audience. First, the project is not able to be generalized to the wider Denver area. Due to the nature of the qualitative research and the low population sample, conclusions cannot be

applied to a larger population. Additionally, there could be issues with generalizations since two of the participants were from out-of-state.

Second, the project ran into issues with the sampling technique. The snowball method was ineffective in getting referrals for potential participants. Most attempts to reach individuals through the snowball method were unsuccessful. Due to the ineffectiveness of the snowball sampling, the sampling strategy had to be changed to a convenience sampling. However, both sampling techniques are similar in their limitations and should not skew the results.

Third, and finally, focusing on demographics may not be the most effective way to segment the market (Diamantopoulos, 2003). Some literature suggests that other variables may be more effective in segmenting the market for green consumers (Peattie, 2010). These variables include personal values and individuals' sense of self-identity (Peattie, 2010). However, conducting research based on variables other than demographics would not be practical due to the time and resource constraints of the project. Additionally, it is unlikely IES would have the capacity and resources to target individuals based on personal values and sense of self-identity. Socio-demographics are readily available and can be identified easier than other variables (Diamantopoulos, Schlegelmilch, Sinkovics, & Bohlen, 2003, as cited in Myers, 1996). Therefore, socio-demographics was the most effective strategy to identify the target market.

Conclusion

In conclusion, the capstone project successfully answered the four research questions and will help IES better engage with their target audience. The secondary research discovered that individuals with some college education and parents are the demographics most likely to switch to CEC-free household products. Additionally, the semi-structured interviews revealed three

barriers to engagement: 1) lack of knowledge of CECs, 2) time constraints, and 3) interest level of the CBSM effort. Additionally, the interviews discovered two solutions to overcoming the barriers: in-person interactions and word-of-mouth through the target audiences' social networks.

The policy recommendations put forward specifically target the identified barriers while taking into account the limited resources available to a small local nonprofit like IES. All three recommendations—creating social diffusion through the target audiences' social networks, creating small virtual projects with local businesses who are concerned about water quality, and setting up booths at weekend markets—will help IES further their goal of reducing household products with CECs in the Front Range.

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Appendix A: Target Audience Informed Consent and Interview Protocol

I am conducting interviews to gain a better understanding of how environmental non-profits can reach individuals who may be interested in protecting their local water supply by reducing their chemical footprint.

This project looks to encourage individuals to reduce their chemical footprints by either decreasing the usage of household and personal care products containing chemicals of emerging concern (CEC), switching to CEC-free products, or producing homemade products utilizing safe ingredients. CECs are potentially carcinogenic chemicals that could alter the normal functions of hormones resulting in a variety of health effects. CECS include DEET, BPA, and antimicrobial

agents. CECs can be found in many household and personal care products, such as hand sanitizers, sunscreens, and toothpaste. These chemicals are unregulated by the U.S. government, and many municipal water treatment systems do not have the ability to remove them from the water supply. Therefore, prevention is imperative. We are here to understand where, when and how to connect with individuals who may be willing to switch to more environmentally friendly products.

I will be transcribing the interview, but your identity will remain anonymous and confidential. This will be done by redacting any identifying information from the transcripts. The interview should last between 10-15 minutes. Your participation in this interview is voluntary, and you may stop the interview at any time or refuse to answer any of the questions if you so choose.

<p>Demographic Questions (ensures interview is with target audience)</p>	<ul style="list-style-type: none"> ● How old are you? ● What is your highest level of education? ● In which general area do you live? ● How concerned are you about local environmental issues? <ul style="list-style-type: none"> ○ Any specific local issue? ○ How did you hear or become concerned about it?
<p>Research Question 1: What community engagement barriers does IES face in implementing an effective CBSM campaign to their target audience?</p>	<ul style="list-style-type: none"> ● Have you heard of Chemicals of emerging concern before? CECs include DEET, BPAs, if so, how much do you know about them and how did you hear about them? ● Are there any situations where you may be more willing to engage with a nonprofit to learn about local environmental issues, such as CECs? Would you be willing to attend a workshop to learn more about CECs and ways reduce their use? What about to watch a webinar online, talk with people in the community? ● Why would you be more willing to engage with a nonprofit in one situation verses another? Time constraints? Does location matter? ● If location matters, what are some places you go to regularly where you would be more willing to engage with a nonprofit? What are some places you go to regularly

	where you would be less willing to engage with a nonprofit?”
<p>Research Question 2:</p> <p>What strategies can IES initiate to overcome these barriers?</p>	<ul style="list-style-type: none"> • What do you think would be an effective strategy to encourage people to adopt environmentally friendly habits such as reducing CEC? For instance, would you be more likely to change your behavior based on conversations with friends, signs reminding you of the dangers, local news coverage? • Can you think of any barriers in switching to products that are CEC free? • What type of businesses or organizations do you most trust regarding local environmental issues? Are there any that could gain your interest in learning about CECs?

Appendix B: Potential Partners Informed Consent and Interview Questions

I am working on my final project for a Master’s in Public Administration and I am conducting interviews to gain a better understanding of how environmental non-profits can reach individuals who may be interested in protecting their local water supply by reducing their chemical footprint. You have been identified as being potentially an interested individual based off of secondary research and a referral from someone who knows you.

We are looking to create a social marketing campaign to encourage individuals to either reduce their usage of CEC household products, switch to CEC-free household products, or produce homemade products utilizing safe ingredients. CECs are potentially carcinogenic

chemicals and endocrine disruptors that could alter the normal functions of hormones resulting in a variety of health effects. CECs can be found in many household and personal care products such as hand sanitizers, sunscreens, and toothpaste. These chemicals are not regulated by the U.S. government and many municipal water treatment systems do not remove them from the water supply. Therefore, we want to create a social marketing campaign to prevent these chemicals from entering the water supply to begin with.

Your identity will remain anonymous and confidential. The interview should last between 5-10 minutes. Your participation in this interview is completely voluntary and you may stop the interview at any time or refuse to answer any of the questions if you so choose. Also, please note that I am not trying to actually set up any type of agreement between your business and the nonprofit I am conducting this project for. I am simply trying to get information in order to provide possible strategies for them.

<p>Research Question 4:</p> <p>What types of organizations would be best suited for IES to partner with or to host CFP workshops?</p>	<ul style="list-style-type: none"> ● Have you ever partnered up with a nonprofit before to tackle a local environmental problem? <ul style="list-style-type: none"> ○ Why or why not? ● Are there any specific elements that would make you more willing to form a partnership? Such as mission of the nonprofit, past projects, probability of success? ● If yes, what was the most successful partnerships you had participated in? ● What types of events or projects would you be interested in partnering in? ● Would you be willing to promote a virtual workshop conducted by a nonprofit on a local environmental issue via your social media accounts?
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