

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF MARKETING

Effects of Musical Key and Message Framing on Intended Shower Time

ALEXA PRINCE
SPRING 2025

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Marketing
with honors in Marketing

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ABSTRACT

Music has been widely accepted and understood to have strong impacts on affect, with many different elements of music studied to determine how they work together to evoke certain feelings and emotions. Affect is a large part of influencing consumer behavior, rendering the first step towards motivation to change or engage in a particular behavior. When aiming to change behaviors of consumers that are not centered around purchasing a product or service, such as engaging in an action that will have more positive environmental impacts, various strategies exist to try to appeal to different consumers. Some consumers are more egoistically motivated to act sustainably, finding benefits like cost savings or higher quality items most enticing. Others are impacted by feeling like their actions are serving a greater purpose or feel motivated by altruistically helping the environment or others. Due to the complexities that exist within choosing messaging for these kinds of sustainable campaigns, this paper will identify which, if any, combinations of music and advertisement script content generate emotional responses and behavioral intention changes for an audio radio or podcast advertisement encouraging listeners to shorten their shower time. Understanding the effects of the musical key (major or minor key) and egoistically or altruistically motivated scripts in the context of a radio or podcast ad offers insight into targeting certain consumer feelings and generating either positive or negative affect in hopes of adjusting their attitudes and eventual behavior. Something as simple as the key that background music is in or the way a message is framed has the potential to have amplifying effects on the reception of the audio content presented to consumers, harnessing the power of music and motivation to be able to impact how consumers feel about certain causes, and laying the foundation for an eventual behavior change.

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ACKNOWLEDGEMENTS

I would first like to thank Dr. Coupland, for her commitment to her honors students in keeping them engaged, supported, and motivated. Dr. Coupland, thank you for connecting me with Dr. Christenson and for your consistent support, regular check-ins and the conversations that we shared over the past couple years. This thesis could not have been completed without you and your unwavering support.

Dr. Christenson could not have been a better thesis supervisor to me. From our first meeting, his passion, knowledge and enthusiasm excited and motivated me. Dr. C, I greatly appreciate your willingness to meet regularly and answer questions, your flexibility, the support that you gave me, and the knowledge about conducting research that I will carry with me. I will greatly miss our meetings and conversations between the work, and appreciate your commitment to not only helping me complete my thesis, but to learn about the research process as whole.

I would also like to thank Dr. Winterich, who laid the foundation for a lot of the content in this thesis. Her Sustainability Marketing course led to my interest in behavior change. Dr. Winterich, thank you for your enthusiasm as a professor inside and outside of the classroom. Your passion as an educator and researcher and desire to really impact students is inspiring.

It would be a disservice to not acknowledge all parts of my Penn State journey, which started at Penn State Berks. Dr. Feinstein, thank you for teaching me that I love to learn and for stretching my brain in class and encouraging me to reach beyond the obvious. I will never forget the classes I took with you, the lessons you taught me, and the fun that I had engaging with your

course material and extracurricular activities. Thank you for your guidance and coaching as I applied to Schreyer and the huge role you played in my journey in Honors at Penn State.

To Dr. Kulturel-Konak and Dr. Konak, thank you for your endless support over the last few years. You laid the foundation for my love for research and writing, and the opportunities you have given me over the years truly made this thesis possible. I appreciate your flexibility, your passion, your trust in me on such an important project, and your kindness to me every week. My college experience and experience in the honors program would have been very different without the knowledge and skills you have helped me build.

Lastly, to my mom, a Schreyer Scholar herself, thank you for setting an example for me of what it means to go beyond the required and to reach for greatness in all you do, whether that is as a student, in your career, or as a parent. Yours and Dad's unwavering support and investment in me and my education has shaped me into a person, student, and businesswoman that I am proud of, and I will be forever grateful for all you have done for me throughout my life.

I could not have completed this thesis without the support of these people and countless others who have shaped my love of research and learning, who have coached and mentored me, and who have shown me consistent support and encouragement. Thank you to Penn State and the Schreyer Honors College for this wonderful opportunity to grow as a student through research, it has been such a valuable and memorable experience.

LITERATURE REVIEW

Sensory and Auditory Marketing Origins

Music has always been and continues to be a huge part of humanity, and its impacts and effects on people is an area that has been consistently explored in modern literature. Music has been long identified as having psychological impacts on the way that humans feel, and this application can exist in many contexts. Linking these psychological implications to marketing has resulted in several strategic considerations when using music in advertisements, as in-person background music, and as a marketing tactic to influence consumer behavior.

Bruner (1990) sought to connect psychological elements of music impacting mood to marketing concepts and tactics. He confirmed that particular music evoked certain emotions or generated different affect, connecting fast tempos to excitement and slower tempos to calmness. Higher pitched music tended to evoke happiness, while lower-pitched music tended to evoke sadness. It was identified that in retail settings, the tempo of the music had impacts on the time spent shopping, with faster music speeding up shopping pace and ultimately reducing overall spending. Bruner concluded that marketers can use music as a tool to shape consumer mood and ultimately impact their behaviors, aligning musical selections with the desired tone or outcome of a campaign. Scott (1990) continued challenging the idea that music in advertising serves only as a non-affective background stimulus, emphasizing that music can interact with other advertising elements and serve rhetorical purposes like enhancing memorability of an advertisement, influencing certain emotional responses, and reinforcing particular product claims. Consumers were found to interpret music in advertisements differently based on their cultural backgrounds and learned associations. Scott recognized music's rhetorical role in

improving the effectiveness of advertising strategy, ultimately deepening marketers' understanding of consumer behavior. Kellaris and Kent (1993) aimed to build on using musical elements to evoke desired emotional responses from consumers by considering tempo, tonality, and texture of music. They found that fast tempos increased pleasure and arousal, while slower tempos had calming effects. Major keys were found to be more enjoyable than minor keys, and more dissonant or atonal music elicited feelings of surprise or discomfort. Texturally, classical music was identified as leading to more pronounced pleasure when tempos were faster, while pop music increased arousal, particularly when elements of percussion were emphasized. They called for a deeper understanding of music elements to be able to tailor certain advertisements to consumers by creating certain feelings from particular music. Areni and Kim (1993) specifically tested this by alternating between classical and top forty music in a wine store. Customers were more likely to purchase more expensive bottles (higher average price) of wine while classical music was playing than when top forty music was playing, suggesting that background music can not only impact consumer moods but also their purchasing behavior. Music has potential to influence consumer perception of products or a store, as well as the perceived value of a product being sold.

Human Reactions to Pitch and Tone in Music

Researchers like Zentner (1996) aimed to identify some of the biological associations humans have with music, studying infants' preferences for consonance and dissonance in music, as well as major and minor keys. Infants clearly preferred consonant music, and less clearly seemed to respond differently to major versus minor keys. Certain aspects of musical perception were suggested to be hard-wired and biologically ingrained, not shaped solely by cultural exposure. From a scientific perspective, Mirz et al. (1999) utilized positron emission tomography (PET) scans to analyze central neural processing of certain auditory stimuli. Complex auditory was found to activate multiple cortexes of the brain as opposed to one, providing support that the human brain processes music through both hierarchical and parallel pathways. Juslin and Västfjäll (2008) proposed that not all musical emotions are created equally, and that a wide variety of mechanisms can contribute to the emotions evoked by music, including brainstem reflexes, emotional contagion, visual imagery, episodic memory, etc. They argued that this complexity of emotional responses to music arises not from a single, uniform process, but from the interaction of various mechanisms.

Using imaging techniques, Pallesen et al. (2005) explored how major, minor, and dissonant chords are processed emotionally in the brain. After testing both musicians and nonmusicians, it was found that major and dissonant chords triggered stronger emotional responses when listened to passively, supporting the association of minor chords as being sad and unpleasant. The study confirmed that minor and dissonant chords have the power to evoke negative emotions through the brain's natural processes, and these effects are independent of level of musical training. Bigand et al. (2005) investigated the timing of emotional responses to music, studying how quickly and effectively certain music induces particular emotions in

listeners in both musically trained and untrained study participants. They found that emotional responses to music are intuitive, almost immediate, and universal despite musical training level. Even less than a single second of music was enough to trigger elaborate emotional responses in listeners, with responses being consistent across both short and long excerpts of music. This suggests that even short musical excerpts have power to influence how listeners feel. Cook (2007) theorized that the reason major chords are perceived as positive and minor chords as negative was due to their resemblance to falling and rising pitch movements. Falling pitches in major chords convey a dominant and positive affect while rising pitches, linked to minor chords, convey a submissive and negative affect. Pitch perception was found to be biological, originating from animals using lower pitches to signal strength and higher to indicate submission. Leveraging these chords can cause biological impacts that affect the listeners' feelings and emotions. Juslin et al. (2008) studied emotional reactions to music, but in different contexts. They found that the feeling of positive emotions occurred more frequently when music was playing, whereas negative emotions occurred more frequently when music was not playing. Factors like location, the type of activity being completed, and whether or not participants were alone impacted the type and presence of an emotional reaction.

Effects of Lyrics with Music

Greitemeyer (2009) more closely analyzed lyrical content and their effects on behavior, particularly prosocial lyrics and behavior. It was found that prosocial lyrics led to increased empathy in listeners and increased likeliness to donate to a charitable cause, directly impacting their behavior. Prosocial lyrics can foster feelings of empathy and prosocial behaviors, further emphasizing the ability to influence consumer behavior through lyrical content. Greitemeyer (2011) continued this research further by identifying that participants who listened to prosocial music showed reduced aggression, aggressive thoughts, and hostility, suggesting that prosocial music could have effects on both emotional and cognitive pathways of the brain. Hunter et al. (2010) complicated the notion of effects of music by analyzing contrasting and mixed emotions. Various combinations of tempo and major versus minor keys were analyzed, revealing expected results like fast tempo and major music elevating happiness ratings while slow tempo and minor music increasing sadness ratings. However, music with conflicting cues, like slow-major and fast-minor led to simultaneous feelings of sadness and happiness and mixed emotional responses, revealing that more complex music may simultaneously convey and evoke contrasting emotions. Similarly, Cohen (2010) studied music in the background of films and its role as a source of emotion. It was found that music enhances the emotional depth of films, allowing for stronger emotional associations with the visual component. Film composers can use musical cues to direct the attention of viewers, suggest emotions, and shape the narrative. Music was found to act as an emotional catalyst in films, enhancing the messages presented in films and the audience's engagement.

Effects of Music in Advertisements

Craton and Latos (2011) sought to connect consumer attitudes toward music used in advertisements to their attitude toward the advertisement itself, finding that a negative attitude toward music used in an advertisement can lead to negative perceptions of the advertisement or the brand at large. Advertisers should be cautious, and not assume that music will always automatically enhance the effectiveness of an advertisement. It is considered in best practice to ensure that a good fit exists between the music and the advertisement's message, and music should be tested with a target audience to determine and predict its impact on the attitude of consumers. Considerations involving music and its impact on consumer behavior ultimately drives many marketing decisions, contributing to the greater category of “Auditory Marketing.”

Krishna (2012) coined the concept of sensory marketing, essentially marketing that engages the senses of consumers and ultimately influences their perception, judgment, and behavior. Sound is one of the senses discussed by Krishna, who argues that auditory elements can significantly impact consumer mood and brand and product perception. Sensory elements, including music should be carefully considered and integrated into marketing strategies due to their power to create powerful subconscious associations that influence consumer behavior. Specifically regarding minor and major chords, Willimek (2014) presented the Theory of Musical Equilibration, which suggests that music expresses processes of will that listeners identify with, therefore probing emotional experiences. It was argued that minor chords are perceived as sad not just due to their sound alone, but the process of will they represent, which could elicit an emotional response. Even the volume a chord was played at altered how it was perceived emotionally, with softly played minor chords being perceived as sad, while loudly played minor chords were perceived as angry. Willimek (2017) further developed this research,

finding that major chords are perceived as affirming and express the will of “Yes, I want to!” and minor chords expressed the will of “No more!” and were either perceived as sad or angry. Certain chord combinations were found to be associated with fear, panic, warmth, or a feeling of floating.

After the defining of sensory marketing, sound marketing, and music’s role in influencing consumer perceptions and behaviors, research emerged that explored specific research questions regarding different musical elements and their impact on different senses, emotions, and behaviors. Ballouli and Bennet (2014) explored how analogous, or brand specific music can impact shopping behavior, particularly in the sports retail environment. They found that exposure to music while shopping that was aligned with the brand’s identity increased their overall satisfaction with the shopping experience, led to more favorable brand attitudes, and led to a more positive shopping experience, serving as an example of linking marketing terminology like brand identity to the use of auditory marketing. Bakker and Martin (2015) further emphasize that major and minor chords elicit emotional responses, with major chord triads being associated with positive emotional connotations and minor chords being associated with negative emotional connotations.

Lowe and Haws (2017) considered another element of auditory marketing, pitch and its impacts in marketing contexts. It was found that lower-pitched sounds created a mental image in consumers of a larger product size. Consumers have been found to use sound as a cue to determine certain product attributes, and linking these attributes to appropriate sounds or music can create more alignment in consumer minds, influencing their buying behavior. Similarly, Lowe et al. (2019) found that lower pitched background sounds led to more risk-averse behavior, where participants engaged in less risky, safer choices like purchasing higher insurance prices.

Anxiety levels of participants were found to spike when hearing the lower pitched background sounds and not knowing where the sound came from. Wang et al. (2021) investigated how altering vocal pitch levels can influence brand perception, consumer trust, and consumer willingness to engage with a particular brand. It was found that in situations where reliability and trust are essential, persuasion may be enhanced by a calm, steady tone. However, when trying to elicit excitement or urgency, a more dynamic tone can more strongly influence persuasion. Pitch has been found to encourage other behaviors pertaining to consumer choice, as found by Huang and Labroo (2020). Higher pitched music played in grocery stores increased likelihood of making healthier, low calorie choices in consumers, especially in women. Certain retail environments, especially in health food stores or promoting healthy products can cause consumers to have increased morality, perceiving healthier food choices as more virtuous. Motokoi et al. (2022) later supported this, finding that positive emotions evoked by music were associated with a stronger preference for sweet foods and healthy savory foods, and feelings of arousal evoked by music led to a preference for less healthy, indulgent savory foods.

Smit et al. (2019) tested how features of music like roughness, harmonicity, pitch height, and familiarity with Western music impacted participant ratings of pleasantness or happiness. Roughness was found to be linked to unpleasant emotions, while harmonicity was linked to pleasant emotions. Those who were more familiar with chord progressions used in Western music found them to be more pleasant, identifying the role that cultural exposure influences emotional responses to music. De la Mora Velasco et al. (2021) sought to leverage the emotional power of music in the background of instructional training videos. Background music and sound effects were found to increase attention and make the content more enjoyable and engaging, allowing listeners to better maintain focus and rhythm during learning. However, it was essential

to seamlessly integrate background music and sound effects with the content to avoid cognitive overload.

Certain emotional triggers can also be prompted by musical engagement, as studied by Mori (2022). Chills were found to be linked to rhythmic features of music, while tears were associated with harmony in major chords. Lyrics with sorrowful themes, like loss, sadness, or farewells was correlated with tear responses, while positive lyrical content did not predict tear responses. These specific acoustic and lyrical combinations have been found to evoke strong emotion, even manifesting physically through tears and chills.

Sensory marketing has been found to influence brand experience in stores, and Shahid et al. (2022) analyzed sensory marketing cues in luxury retail stores, finding that these cues can significantly enhance brand experience and brand loyalty. They call for luxury retailers to create a multisensory shopping environment for consumers to maximize the impact of sensory marketing in building consumer loyalty. Sensory marketing has been studied in various industries, including tourism by Jiang (2022), who found that playing natural soundscapes increased emotional arousal and emotional pleasure of tourists. Tourists may feel more inclined to purchase from a store or participate in attractions if they feel immersed in a sensory experience. Combining audio elements like audio hardness with particular lyrics has musical implications of how a genre is perceived. Czedik-Eysenberg et al. (2024) found that harsher lyrical themes are associated with greater audio hardness. For instance, themes like “death,” “dystopia,” “religion and satanism,” and “madness” were strongly correlated with higher audio hardness. Themes about “love and romance” or “personal life” were negatively correlated with audio hardness. It was found that lyrics and sound work together to influence perceptions of metal music, and of the genre as a whole.

Emotional characteristics of chord progressions have even been found to influence groove, defined as the urge to move when listening to music. Kawase (2024) found that using happier, more positive chord progressions encouraged listeners to move their bodies. Groove was found to be influenced by emotional qualities of chords as well as the rhythmic complexity of certain melodies. Zhang et al. (2025) revealed through a study that chord progressions play an essential role in influencing the emotional experience of music. Major chords were rated as more pleasant and beautiful and less tense than minor chords. The chord progressions themselves had the ability to enhance the differences between major and minor chords, depending on if the progressions were stable or unstable. Manipulating the intrinsic quality of chords as well as the musical context in progressions can maximize or minimize certain emotional experiences.

Existing research strongly suggests that music has great effects on eliciting particular thoughts and emotions on listeners. Music is a form of sensory marketing, which has been proven to have strong impacts on generating particular emotions and perceptions. There are many elements of music that when individually manipulated, can have impacts on thoughts, behavior, emotion, and other senses. For marketers, understanding the impacts and power of music in advertising campaigns, as background music, and as a product can have strong effects on influencing consumer brand and product perceptions, willingness to pay, and buying behavior.

Sustainable Behavior Change

Attempting to adjust a consumer's sustainable behavior is a marketing task that comes with a lot of nuance and challenge due to individuals' preconceived notions, resistance to change, and feeling inconvenienced by adjusting their routines. Effective strategies when influencing someone to engage in a sustainable behavior, or one that lessens the negative impact on the environment, can vary from individual to individual. Dickerson et al. (1992) studied the impact of cognitive dissonance on behavior change, with a focus on environmental conservation. It was found that committing to making a change publicly combined with gaining self-awareness of past unsustainable behavior was more effective than either approach alone. Those who felt they were being hypocritical became more motivated to make a change. The study results suggested that the feelings generated in consumers from arousing cognitive dissonance was effective in driving sustainable behavior change. Strong (1997) found that many sustainable marketing campaigns were too focused on descriptive information rather than properly creating emotional appeals or appropriately communicating possible benefits gained by consumers when supporting fair trade companies. Best practices emerged of developing narratives that highlight the impact on humans when supporting fair trade, emphasizing tangible and relatable benefits, and focusing on creating emotional connections with marketing content.

Whiteman (1999) called for the use of marketing tactics to effectively communicate scientific knowledge in order to promote sustainable behaviors. Leveraging these marketing techniques was found to be essential to ensure that sustainability messages penetrated mainstream media, focusing on developing creative and emotionally appealing campaigns. This was one of the earlier instances of linking scientific environmental information to conventional marketing. Priewasser (1999) highlighted that emotional factors, not just rational factors played a

large role in motivating consumers to choose between environmentally friendly transportation over other methods. The paper calls for a combined approach to change behavior, addressing rational factors like time or cost and emotional factors like convenience or comfort. Emotional response was found to play a significant role in ultimately influencing behavior.

McDonald and Oates (2006) emphasized the need to make sustainable activities seem both easy and impactful. Consumers were limited if perceived effort of changing their behavior was high and motivated if perceived difference in the planet the activity made was high. A need for clear, targeted marketing strategies was identified to reduce perceived effort of sustainable tasks and increase perceived positive environmental impact. The emphasis on adjusting sustainable behavior led to the concept of social marketing being used in sustainability marketing. Peattie and Peattie (2009) proposed that addressing both psychological and social barriers to sustainable behavior is essential to influence behavior change, and suggested straying further away from promoting product substitution alone as a way to behave more sustainably.

Conflicting literature emerged, with Barr et al. (2011) critiquing market-oriented behavior change approaches, identifying that sustainable behaviors are often seen as being more low-cost or pragmatic as opposed to being driven by deeper emotional values. Integrating context-specific strategies to maintain consistency in the adoption of sustainable practices. It is encouraged to incite motivation through deeper environmental connections, rather than just through incentives or obvious benefits. In the realm of perceptions of different environmentally friendly tasks by consumers, Rettie et al. (2012) suggested a reframing of how “normal” certain behaviors are viewed. Socially, if consumers feel as though an action is normal, they are more likely to overcome the attitude-behavior gap to change a behavior. Similarly, making unsustainable behaviors seem abnormal puts social pressure on consumers to adjust their more harmful habits.

Many marketers have been faulted with focusing solely on descriptive, educational, or factual content in sustainability messaging, rather than making customer-focused appeals that target customer emotions and needs. Villarino and Font (2015) label this “sustainability marketing myopia,” where product-based or descriptive messaging is overemphasized and addressing customer needs is underemphasized. They propose a strategy of focusing on individual customer benefits over broader societal impacts, but that a balance of emotional and factual content would have greater impacts on making marketing messages more persuasive. The paper calls for a shift in sustainability marketing to become more emotional and customer-focused, as well as actional to overcome said sustainability marketing myopia.

Kácha and Ruggeri (2019) identified limitations in the message framing alone in driving long-term behavior change. They found that there are strong correlations between self-centered motivation and sustainable behavior, but the messages alone were not enough to have significant effects. Doughty et al. (2021) called for a structured approach to change behavior, combining behavioral theory, empirical evidence, and strategic communication. They emphasized the need to rely on social norms and trusted information sources as essential levers to change behavior. De-loyde et al. (2022) attempted to use a labelling system to incite certain feelings in consumers and influence them to purchase ingredients for a sustainable diet at the grocery store. They found that eco-labeling was the most effective at promoting these more sustainable grocery choices, but too strong of a social nudge produced more negative reactions. Stronger negative reactions can cause resistance to acting sustainably, but it was confirmed that consumer motivation was essential, that those motivated to act sustainably were most influenced by eco-labeling. This suggests that targeting the egoistic and altruistic motivations that consumers already have could be an effective strategy to influence their behavior.

Ibáñez-Rueda et al. (2023) found that those previously engaged in pro-environmental behavior were more likely to take shorter showers. They also found that certain psychological elements such as perceived connectedness to nature and anxiety had influence over average shower times. A feeling of connectedness was found to influence sustainable behavior, implying the necessity of generating a feeling of positive affect and feeling when trying to influence behavior. Urbild et al. (2023) similarly identified that those who had higher levels of climate-related anxiety were more inclined to engage in sustainable actions, like making sacrifices for the environment or donating money. Since climate distress can drive action, public messaging should acknowledge climate anxiety and find a balance between generating feelings of concern and not generating excessive fear. Emotional responses to climate change can play a crucial role in shaping eventual environmental action. Lee and Lin (2022) examined how brands that advertise sustainable clothing impacted their customers' perceptions of their brand and its Corporate Social Responsibility image. They too found that sustainable messages appeared to be more effective for audiences who had pre-existing positive attitudes toward sustainability, suggesting a focus on Gen Z consumers who are more familiar with sustainability themes and are generally more environmentally conscious. It seems that messaging that makes emotional appeals to consumers who already care about sustainability causes can more easily influence behavior and perceptions of a brand, as well as strengthen brand loyalty.

Also identified in recent literature was Null and Asirvatham's (2023) findings that younger generations had strong pro-environmental attitudes but lacked knowledge. They found that even when college students had access to more environmental knowledge, it did not necessarily lead to sustainable action. The framing of why a consumer should engage in certain behaviors and their emotions towards them seem to be just as crucial, if not more than their

actual level of education on environmental issues. Yang et al. (2022) found that green empowerment ads that focused on empowering individuals to make an impact were more effective than more traditional green appeals, such as focusing on factual environmental benefits of a product or behavior. Green empowerment ads were found to greatly influence and enhance purchase and behavior intentions when consumers felt they had agency to create a positive change. In an effort to validate the strength of green empowerment advertisements, Van Breda et al. (2023) tested green empowerment advertisements against messaging with fear and guilt appeals. They found that fear and guilt appeals did not significantly influence participants to behave in a more pro-environmental manner. Attitude towards sustainability was found to be the strongest predictor of behavioral intention, suggesting that enhancing positive attitudes towards sustainability is a better strategy than invoking fear or guilt in consumers.

Seeking to understand barriers that exist for consumers to purchase sustainable products or engage in more sustainable behavior, Tomberg (2024) analyzed willingness of consumers to pay for efficient shower heads. He found that only a minority of consumers actually felt that the different shower heads reduced their comfort but that concerns about reduced comfort were more common than any other concern regarding the showerhead. Overall, price was not the main barrier to adopting these more efficient shower heads, but non-monetary factors like the perceived hassle, comfort, effort of installation, and change of habit. Hällfritsch et al. (2024) also found that this resistance to sustainable action could have implications in gender, with women consistently acting more sustainably than men. Sustainability can often be perceived as feminine, and that the proper framing of sustainable causes has the ability to increase pro-environmental attitudes in men.

Research in this field suggests that there are many moving parts when it comes to influencing and motivating consumers to engage in sustainable behavior. Many barriers exist, from psychological or gender barriers to emotional deterrents like fear turning individuals away from eco-friendly behaviors. The literature does suggest the necessity for generating certain positive or negative feelings, or affect, in order to encourage consumers to adopt new behaviors. It was seen that feelings of connectedness to the environment or anxiety towards the environment had powerful effects on consumers, in combination with the different consequences of the choices sounding more or less motivating. Empowering consumers to create positive attitudes about the environment and their ability to make an impact has been shown to be more effective in inciting sustainable behavior than overly factual appeals or guilt and fear appeals. Since music has long been found to have profound effects on eliciting certain positive or negative emotions in listeners, it is worth investigating its impact on consumer affect, as these emotions have the potential to change attitudes and ultimately behavior.

Message Framing and Consumer Motivation

The way in which marketing messages are framed to consumers can have drastic effects on how the messages are received, interpreted, and realized. In the case of motivating consumers to engage in a sustainable behavior, there are often gaps between the intended message or desire of the advertiser and the perception or action of the consumer. Understanding the different ways that consumers can be motivated and the ways to prompt that motivation provides insight into the best strategies to target them to engage in a sustainable behavior. Research has been conducted, especially in recent years, to understand how marketers can best appeal to different types of consumers when trying to motivate them to either purchase a sustainable product or behave in a more environmentally conscious way.

Tversky and Kahneman (1981) introduced the concept of framing effects, revealing that the way certain choices are presented or framed to consumers can influence their decision-making, in both rational and unexpected ways. Their introduction of prospect theory, where losses loom larger than gains, provided evidence that people can engage in the same behavior but are motivated by vastly different messaging. Reframing consumer choices as having outcomes most desirable to that particular group of individuals can alter their behavior. Axelrod and Lehman (1993) combined this idea with self-efficacy, or the belief in an individual's own ability to act to predict behavior. They identified a complex interplay of motivation and efficacy beliefs that impact how individuals act in regards to the environment. It was concluded that both internal and external factors can jointly influence pro-environmental decisions. Davis (1995) studied the interaction between message framing and the consumer's regulatory focus, such as whether they were risk-averse, optimistic, cautious, or environmentally engaged individuals. When the type of message and the individuals own focus were matched, stronger behavioral

intentions to engage in sustainable behavior was reported. Frames that were mismatched led to lower intentions. Not only can framing positively impact consumer behavior intentions, it can have an opposite effect when the framing is unmatched to the individual.

Kaiser et al. (1999) identified ecological behavior intention in combination with established environmental values and knowledge as dimensions impacting sustainable behavior. Environmental knowledge and values were found to explain 40% of the variance in ecological behavior intention. Properly framing messages to correctly deliver information to educate consumers about ecological issues while motivating them to be invested in these causes as a part of their values can have an impact on their behavior intention and actual behavior. Predicting pro-environmental behavior can also be made more accurate by considering values and level of environmental knowledge in combination with behavior intention. Social marketing can also be combined with framing theory, as Kaczynski et al. (2005) tested in messaging from parks and recreation agencies. They found campaigns with an emphasis on economic and community benefits for individuals to be most effective in building public support. Attitudes were found to be more resistant to change than beliefs and intentions, calling for deeper and prolonged engagement with the public to alter their sentiment.

Baumeister et al. (2007) proposed that emotions alone did not immediately cause actions, instead providing feedback to the brain to form new if-then rules in individuals' minds. When people have emotional experiences, they begin to associate certain outcomes with behaviors, and their behavior is driven by the anticipation of those emotional outcomes. Simple emotional appeals more contribute to the learning and anticipation of outcomes, not directly triggering behavior. If an individual associated saving money or time with positive emotions, they might be more likely to engage in a behavior that recreated these emotions. White and Peloza (2009)

found another impact on motivation to be whether the behavior was performed in a public or private setting. When asked to donate to a charitable cause in a private setting, appeals that targeted personal gains to individuals performed better, while more selfless appeals were more effective in public. Without social pressures, individuals were found to be more motivated by achieving personal benefits. Matching the visibility of the behavior to the audience's characteristics could maximize effectiveness.

Motivations for Prosocial Behavior

Motivation to participate in some kind of moral act, including making pro-environmental choices can be split into two categories: egoistic motivation, where the individual is acting in a self-serving manner seeking their own benefit, or altruistic motivation, where the individual is acting for the greater good or for the benefit of others. Cheng et al. (2011) found that loss framing of messaging was more effective in promoting sustainable behaviors, where consumers felt that their resources, time, or money were being impacted. For low-salience issues like energy or water conservation, loss frames seemed most effective, targeting personal losses for consumers due to the behaviors they were actively engaging in. Similarly, Grazzini et al. (2018) found that combining loss-framed messages with detailed instructions on how to recycle resulted in higher recycling rates of hotel guests than gain-framed messages. Emphasizing the negative consequences of recycling was found to be more impactful than highlighting the benefits of recycling. They called for a combination of framing effects and self-efficacy building strategies to influence sustainable behavior, ensuring consumers feel empowered and able to engage in sustainable behaviors.

Seeking to investigate how egoistic and altruistic motives can coexist when it came to ethical food consumption and purchasing local food, Birch et al. (2018) found that egoistic factors were stronger predictors of behavior. In this particular study, environmental consciousness did not significantly influence consumer attitudes or behaviors. However, this study has implications that depending on the environmental cause, consumers may have different overall motivation towards it, depending on the way the behavior will directly or indirectly impact them.

Younger generations (Gen Z, Millennials) have been reported to have higher environmental concern than previous generations, but still lack consistency in engaging in environmentally conscious behaviors. Perrault and Clark (2018) completed a study that found that 43% of students were motivated by protecting the planet, while 18% and 19% were motivated by monetary savings and moral responsibility respectively. Students indicated that they would be more motivated if they had access to more information and education, more convenient avenues to engage in sustainable behavior, and more affordable options. There seems to be a consistent gap between younger generations' attitudes towards the environment and their actual behavior.

Pittman (2020) wanted to explore how the accountability factor, whether an act was performed in a public or private place, moderated how effective egoistic or altruistic appeals were when promoting prosocial or pro environmental behaviors. It was found that when individuals have public accountability and know their decision will be seen by others, altruistic appeals are more persuasive. However, in private, egoistic appeals that highlight personal benefits are more effective. Otterbring et al. (2021) found that narcissists responded to egoistic motivations to engage in prosocial behavior during the COVID-19 pandemic rather than altruistic motivations. Women generally showed more compliance and willingness to accept personal restrictions for the greater good. Tailoring messages to narcissistic traits focusing on self-protection and using negatively framed messaging increased compliance in this demographic.

Catastrophic messaging regarding biodiversity loss was found by Joshi (2022) to backfire due to fear avoidance of consumers and psychological reactance. People were less likely to adopt sustainable behaviors when they were perceived as difficult, expensive, or less comfortable.

Moderate-risk messaging coupled with efficacy-building strategies was affirmed as being stronger than fear appeals. Raising the concern of consumers without overwhelming them and providing simple action steps was found to be the most motivating when it came to sustainable behaviors. When trying to convince employees in a study to choose electric vehicles, Decrinis et al. (2023) found that gain framing via email increased the odds of consumers choosing an electric vehicle up to 3.7 times. Emotional framing showed short-term positive effects on consumer motivation. Gain framing focused more on highlighting egoistic appeals, especially due to car purchases being a large purchase that requires budgeting, time, and energy. Social media was also found by Alam et al. (2023) to influence consumers' environmental and self-benefit concerns, ultimately leading to stronger green purchase intentions. Consumers that had a strong green attitude had a high likelihood of converting both altruistic and egoistic motivations into actual purchase intentions. Social media has been proven to be a regular source of environmental information and encouragement to behave sustainability.

Slotnick et al. (2023) found that women were more likely to make environmentally motivated choices when it came to food consumption. They studied university students and found that while they were motivated by altruistic environmental concerns, they lacked a lot of knowledge about their perceptions of the climate impact of certain behaviors. For example, many students underestimated the environmental impact of red meat consumption but overestimated the environmental impact of recycling. They called for a strengthening of public education to share climate-related information and a combination of emotional and educational appeals. Aggarwal et al. (2024) emphasized the importance of tailoring green marketing strategies based on consumers' values. Altruistic consumers respond more strongly to appeals about environmental benefits and social responsibility, while egoistic consumers are more impacted by

personal health, safety, and monetary benefits. Egoistic consumers were less likely to pay a premium for green products, but altruistic consumers were not deterred by a higher price point.

Research long supports the necessity of marketers adjusting their messaging based on the consumers they are trying to reach and the settings they are reaching them. Careful consideration of the framing of sustainability messages is vital to reach consumers who are either egoistically or altruistically motivated when engaging in pro environmental behaviors. Many factors, including location of the decision, gender, convenience, cost, education level, and more can impact consumer attitudes toward behaving sustainably. It seems that framing sustainability messages as altruistic or egoistic is dependent on the behavior itself, the audience, and the nature of the delivery.

HYPOTHESES

With music being proven to have strong effects on eliciting consumer emotions, research has been conducted to test individual elements of music and their impacts on affect, motivation, and behavior. Marketers could learn from determining if the key of background music used in an advertisement has an impact on how consumers feel and their intention to change their behavior.

Since sustainable behavior change has typically been met with previous apprehension by consumers, researchers have sought many strategies for best impacting them through various emotional appeals. One such way is in the framing of the messages themselves, targeting different personalities and demographics of consumers with different messaging. Since individuals can vary in their motivations to engage in sustainable behaviors, framing a sustainable habit, such as reducing shower time, in a way that either is self-motivated or for the greater good and identifying how consumers respond may shed light on marketing strategies to employ when appealing to consumers. Furthermore, discovering if there is an ideal combination of the key of background music in a podcast advertisement encouraging consumers to reduce their shower time and the framing of the message in generating positive or negative affect has value in marketing contexts for influencing consumers' behavioral intentions.

Reducing shower time was selected as the sustainable behavior for this particular study, with the respondents' intention to shorten their shower duration being a dependent variable. After considering various possible sustainable behaviors to include in the study, reducing shower time was selected firstly due to its alignment with the survey audience. Reducing one's shower time is applicable to the audience of the survey, made up mostly of college students, and did not

require explanation of how to engage in the behavior. The behavior itself does not have many barriers to change for this audience and is relatively easy to change with individual effort. Reducing shower time was also easy to use when developing scripts that differed in framing to maintain consistency, and is not typically a polarizing sustainability topic when it comes to personal or political values of individuals. Therefore, this behavior was measured as a dependent variable in the study, with independent variables being the type of musical key and the type of message framing. Based on the conclusions from the literature analyzed, I hypothesize the following:

Since consumer motivation can change based on different affective states of consumers and adjusting the key of the music can alter emotional feelings and how content is perceived, I predict that the effects of these together will vary depending on the combination of message framing and musical key used.

Hypothesis 1 (H1): The interaction between message framing (either egoistic or altruistic framing) and musical key (major or minor) will elicit different emotional responses.

Since it was found in above literature that altruistic behavior was amplified when consumers are in public, and showering is a behavior done in private with no outside accountability, I predict that egoistic framing that offers personal benefits of reducing shower time to listeners will prove to be more effective.

Hypothesis 2 (H2): Egoistic framing will have a stronger impact on consumers' intention to shorten their shower time compared to altruistic framing.

Lastly, major keys have been found to elicit positive feelings in listeners (joy, empowerment, excitement), even in background music contexts and only in short exposures. Feelings of empowerment were found to be strong in their ability to adjust consumer attitudes and motivate them to behave sustainably, so I predict that this combination should produce the strongest emotional response in individuals.

Hypothesis 3 (H3): The interaction between the major key of background music in a podcast advertisement and altruistic framing will elicit a stronger emotional response in respondents than any other combination.

METHODOLOGY

In order to measure the impact of major or minor chord progressions combined with egoistically motivated and altruistically motivated advertisement content, a 2 by 2 experimental survey was created. Survey respondents ($N = 77$, $M_{\text{age}} = 21.75$, 57% male) were presented with one of four combinations of background music and audio content, randomly and evenly generated in the survey.

Two scripts were developed that aim to motivate consumers to engage in the same sustainable behavior, reducing the length of showers. Scripts were developed with the use of Chat GPT to maintain consistency within their tone, length, and content. One script was written from a more self-motivated or egoistic perspective, outlining the ways that engaging in the behavior would benefit the individual, like saving money or time. The other script was written from a more altruistic perspective of helping the greater good and the environment, outlining the harm that wasting water has on the environment and empowering the individual to protect the planet. The following scripts were utilized, both encouraging listeners to reduce their shower time:

Script 1: Egoistic motivation: “Every extra minute in the shower means more money down the drain. Cutting just five minutes off your shower can lower your water bill, save energy, and even make your mornings faster! Less time under the water, more cash in your pocket—it’s a win-win. So, why waste it? Lather up, rinse off, and save big. Save time. Save money. Shower smarter.”

Script 2: Altruistic motivation: “Every extra minute in the shower means less water for those who truly need it. Cutting just five minutes off your shower can help conserve water,

reduce energy waste, and protect our planet. Less time under the water, more resources for the world—it's a win-win. So, why waste it? Lather up, rinse off, and make a difference. Save water. Save the planet. Shower smarter.”

Two background music tracks were also developed to play simultaneously with the radio advertisement scripts. The tracks were similar in their construction, but one track was made with minor chord progressions and the other track was made with major chord progressions.

Respondents of the survey were presented with one audio clip out of four options, (1) Egoistically motivated script with minor chord progressions, (2) Egoistically motivated script with major chord progressions, (3) Altruistically motivated script with minor chord progressions, (4) Altruistically motivated script with major chord progressions.

In order to measure affect, the survey utilized the questions of the Positive and Negative Affect Scale (PANAS) scale in 1-7 Likert Scale format. PANAS has become the most widely used and accepted self-reported questionnaire to measure how stimuli can influence temporary emotions (Watson et al., 1988).

Respondents' initial affect was measured before being exposed to the audio clip and measured after they were presented with a mock radio advertisement and asked a series of questions after listening to the audio clip. Respondents were also asked about their intention to reduce their shower time in general and their intention to reduce the time of their next shower after hearing one of the four audio advertisements.

RESULTS AND FINDINGS

In order to measure results of the survey, Qualtrics data was imported into Excel for cleaning and later imported into SPSS for analysis. Using IBM's SPSS application, Two-way ANOVA tests were conducted. All independent variables were tested for the impact of major or minor keys on them, egoistic or altruistic framing, and the interaction between the two independent variables.

First, a two-way ANOVA was performed to analyze the effect of message framing and musical key on reported overall affect. The two way ANOVA revealed that there was not a statistically significant interaction between the effects of message framing and musical key on overall affect ($F(1,53) = 1.04, p = .312$). Simple main effects analysis showed that message framing did not have a statistically significant effect on overall affect ($p = .459$). Simple main effects analysis showed that musical key did not have a statistically significant effect on overall affect ($p = .996$).

A two-way ANOVA was then performed to analyze the effect of message framing and musical key on reported positive affect. The two way ANOVA revealed that there was not a statistically significant interaction between the effects of message framing and musical key on positive affect ($F(1,73) = 1.35, p = .249$). Simple main effects analysis showed that message framing did not have a statistically significant effect on positive affect ($p = .760$). Simple main effects analysis showed that musical key did not have a statistically significant effect on positive affect ($p = .334$).

Another two-way ANOVA was performed to analyze the effect of message framing and musical key on reported negative affect. The two way ANOVA revealed that there was not a

statistically significant interaction between the effects of message framing and musical key on negative affect ($F(1,73) = .20, p = .659$). Simple main effects analysis showed that message framing did not have a statistically significant effect on negative affect ($p = .413$). Simple main effects analysis showed that musical key did not have a statistically significant effect on negative affect ($p = .369$).

While initially hypothesized that the interplay between the message framing and the key would elicit different emotional responses (H1), there was actually no change in overall affect identified. There was not enough evidence to support a change in overall state of emotion, nor to support a change in either overall positive or negative affect. Evidence also did not support that using major or minor keys had a significant effect in changing the affect or intention to reduce shower time. However, the framing of the messages was found to have some impact. The experiment did not produce evidence to support H3.

A two way ANOVA was performed to analyze the effect of message framing and musical key on intention to reduce shower time. The two way ANOVA revealed that there was not a statistically significant interaction between the effects of message framing and musical key on intention to reduce shower time ($F(1,73) = .592, p = .444$). Simple main effects analysis showed that message framing did have a statistically significant effect on intention to reduce shower time ($p = .021$). Simple main effects analysis showed that musical key did not have a statistically significant effect on intention to reduce shower time ($p = .233$).

While major or minor keys did not have a significant effect on respondent's intention to reduce their shower time, framing was found to have an effect on if respondents intended to shorten their next shower. Therefore, the experiment produced evidence in opposition to H2,

showing that altruistic messaging had a significant impact, while egoistic messaging had no effect.

Although no overall changes in affect were found to be statistically significant, the individual changes of each emotion of the PANAS scale before and after respondents were exposed to the podcast advertisement were also measured.

While no emotion was found to be statistically significantly different among the various groups, a two way ANOVA was performed to analyze the effect of message framing and musical key on feeling excited. The two way ANOVA revealed that there was not a statistically significant interaction between the effects of message framing and musical key on feelings of excitement ($F(1,73) = .004, p = .947$). Simple main effects analysis showed that message framing did not have a statistically significant effect on intention to reduce shower time ($p = .257$). Simple main effects analysis showed that musical key did have a moderately significant effect on feelings of excitement ($p = .067$).

A moderate change in excitement was identified. Respondents who were exposed to an audio clip that had minor chords in the background moderately indicated a decrease in their overall feeling of excitement. This is supported by previous research of minor music's associations with sadness and its ability to often elicit negative emotion.

Additionally, a two way ANOVA was performed to analyze the effect of message framing and musical key on feeling guilty. The two way ANOVA revealed that there was not a statistically significant interaction between the effects of message framing and musical key on feelings of guilt ($F(1,73) = .009, p = .923$). Simple main effects analysis showed that message framing did have a moderately significant effect on feelings of guilt ($p = .071$). Simple main

effects analysis showed that musical key did not have a statistically significant effect on feelings of excitement ($p = .939$).

A moderate change in feelings of guilt was identified. When framing was altruistically motivated, feelings of guilt were moderately stronger in respondents. Framing around the planet and the impact of unsustainable choices on the planet induced moderately more guilt in respondents than egoistic framing.

Overall, a main effect was found that when messaging was framed as being altruistically motivated, or for the greater good of the planet, evidence supports that this will significantly increase the desire and intention of respondents to shorten their next shower. While there was no overall positive or negative affect change, a moderate effect emerged of feelings of guilt increasing when hearing the altruistically framed audio clip, as well as a moderate effect decreasing feelings of excitement when hearing minor chords in the audio clip.

CONCLUSION AND IMPLICATIONS

While the initial hypotheses were not supported by the statistical analysis, several conclusions emerged from the analysis of the survey data. First, it seems that framing plays an important role in influencing behavioral intention of respondents to shorten their shower time. When the framing of the audio advertisement respondents listened to was focused on altruistic motivation, emphasizing the ways that their actions can positively impact the planet, their desire to reduce their shower time increased significantly. Additionally, a moderate effect of respondents feeling guilty when hearing the altruistic message about helping the planet emerged. The framing of the message emerged as being the most significant in generating differences in behavioral intention, while affect remained unchanged.

Although this result was unexpected due to existing literature demonstrating that subtle musical changes, including between major and minor keys can have effects on emotions even in short timeframes, there are several possible explanations for this outcome. The 30-second audio clip may not have provided enough time for an emotional build-up to allow the musical key to influence emotional state. Since the music was used in the background of the audio advertisement, it could have been lost to the content of the message which was in the auditory foreground. It is likely that respondents were more focused on the message's content rather than the more subtle emotional cues embedded in the background music.

Even though there is only evidence in this study to support a moderate change in decreased feelings of excitement when exposed to minor music, there is still research to be done about the ways that the key of music can influence behavior intention of engaging in a sustainable behavior.

In this study, no effect was identified on overall affect, positive affect, or negative affect, but this could be in part due to several limitations of this study. This study used PANAS, which is widely used, but may not have been sensitive enough to detect very quick, small changes in emotion of respondents, especially when the task-itself was not solely a music-listening one. The emotional impact of music and framing could also be highly context-dependent, with effects possibly being more pronounced in entertainment settings, film, or product marketing than in this particular behavior-change message context.

It is also possible that the sample size was not large enough or that the scripts used in the audio clips had slight variability that could have impacted perception of the overall message of the recording. One factor of the study that was also not controlled was the volume, as research showed differences in the sounds and feelings associated with the same chords played at different volumes. Respondents were not required to listen to the audio clip at a specific volume. Respondents were not initially asked about their existing regulatory focus, like if they were risk-averse, optimistic, cautious, or environmentally engaged; which could have provided more insight into their pre-existing tendencies to connect with different messages.

Lastly, it is possible that the content and framing of the message itself overpowered the musical cues. The significant effect of altruistic framing on behavioral intention suggests that message content may play a larger role in shaping behavioral outcomes than subtle emotional manipulations like musical key. This finding points to the need for future research to further investigate under what conditions music can effectively complement behavior-change messaging, and whether different emotional measures or longer exposures might reveal more meaningful effects.

This study only considered shower time as a sustainable habit to change, but there could have been effects in other contexts, such as different sustainable behaviors like taking public transportation, reducing red meat consumption, or recycling. Despite these limitations, this research does provide some insight into the impacts of framing on consumer behavior intention. Taking this research a step further and analyzing the actual behavior changes after exposure to differently framed messages is a possible future research avenue. Additionally, with the discovery of an impact of message framing on the guilt of respondents, researchers could investigate how message framing impacts feelings of consumer guilt and how those feelings of guilt can translate into an actual reduction in shower time.

This study does offer several takeaways for marketing and advertising professionals, first with the takeaway that altruistic message framing can significantly influence behavioral intention. In sustainability contexts, motivation to make a change in behavior appears to increase more significantly when the impact on the environment is emphasized as opposed to financial or time-saving benefits, though this could vary by sustainable habit. If marketers are aiming to encourage consumers to engage in sustainable behavior, they should consider framing marketing messages to be focused on the greater good and collective environmental responsibility.

While a moderate effect was detected between decreased feelings of excitement and exposure to minor chord progressions, it is unlikely that the music would drive behavior change on its own. Music should be used in these campaigns to support the framing of the message strategically, rather than serving as the sole tool in influencing behavior.

Perhaps the most important takeaway is that this study produced evidence of behavioral intentions changing without a measurable change in overall emotional affect. This may provide

insight for marketers that clear, intentional framing in a message is more significant than an overreliance on more mood-based, emotional techniques. Overall, this survey offers guidance for marketers seeking to develop audio-based advertisements that could be used on streaming platforms, radio, and in podcasts. If a short 30-second audio message with altruistic framing can influence behavior intention, this provides evidence for the usefulness of short-form audio messaging as an effective tool in sustainability marketing campaigns.

It is worth exploring how a musical key in advertisements in different contexts or settings impacts behavior intention and eventual behavior, likely with a different scale that can measure quick changes in emotion or feeling after respondents are exposed to stimuli. Perhaps in different contexts there would be an interaction between the way an advertisement is framed and the key of the music it is in, but this remains on a future research agenda.

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APPENDIX

Appendix 1: *Audio Advertisement Scripts**

Script 1: Egoistic motivation: “Every extra minute in the shower means more money down the drain. Cutting just five minutes off your shower can lower your water bill, save energy, and even make your mornings faster! Less time under the water, more cash in your pocket—it’s a win-win. So, why waste it? Lather up, rinse off, and save big. Save time. Save money. Shower smarter.”

Script 2: Altruistic motivation: “Every extra minute in the shower means less water for those who truly need it. Cutting just five minutes off your shower can help conserve water, reduce energy waste, and protect our planet. Less time under the water, more resources for the world—it’s a win-win. So, why waste it? Lather up, rinse off, and make a difference. Save water. Save the planet. Shower smarter.”

*Scripts were developed with the use of Chat GPT to maintain consistency within their tone, length, and content.

Appendix 2: *Survey Questionnaire*

Sustainable Behavior Study

Thank you for your willingness to take part in our academic research! We appreciate your time taking this survey. All survey responses will be kept anonymous. This survey should take approximately 10-15 minutes to complete. Your participation in this research study is completely voluntary, and you can choose not to take part. You can agree to take part and later change your mind, or stop participating at any time. There are no penalties from withdrawing from the survey. If there are questions you do not feel comfortable answering, you may skip questions. Click the arrow to advance the survey. Make sure you are in a location where you are able to hear a short audio clip to be able to complete the survey. If you have any questions or concerns, please contact the Principal Researcher Alexa Prince by email (ajp7020@psu.edu). Title of Project: Sustainable Behavior Attitudes and Affect Principal Investigator: Alexa Prince Faculty Advisor: Dr. Brett Christenson

Do you agree to participate in this survey?

☐ Yes

☐ No

[illegible]

Alert	☐	☐	☐	☐	☐	☐	☐
Ashamed	☐	☐	☐	☐	☐	☐	☐
Inspired	☐	☐	☐	☐	☐	☐	☐
Nervous	☐	☐	☐	☐	☐	☐	☐
Determined	☐	☐	☐	☐	☐	☐	☐
Attentive	☐	☐	☐	☐	☐	☐	☐
Jittery	☐	☐	☐	☐	☐	☐	☐
Active	☐	☐	☐	☐	☐	☐	☐
Afraid	☐	☐	☐	☐	☐	☐	☐

Now listen to the following radio / podcast audio message in full, and answer the questions that follow. (Audio Clip)

How likely are you to reduce your shower time after hearing this message?

- ☐ Very unlikely
- ☐ Unlikely
- ☐ Neutral
- ☐ Likely
- ☐ Very Likely

How likely do you think it is that your next shower will be shorter with this information?

- ☐ Very unlikely
- ☐ Unlikely
- ☐ Neutral
- ☐ Likely
- ☐ Very Likely

The main idea behind the message that "I could save _____ if I showered shorter"

[illegible]

Alert	☐	☐	☐	☐	☐	☐	☐
Ashamed	☐	☐	☐	☐	☐	☐	☐
Inspired	☐	☐	☐	☐	☐	☐	☐
Nervous	☐	☐	☐	☐	☐	☐	☐
Determined	☐	☐	☐	☐	☐	☐	☐
Attentive	☐	☐	☐	☐	☐	☐	☐
Jittery	☐	☐	☐	☐	☐	☐	☐
Active	☐	☐	☐	☐	☐	☐	☐
Afraid	☐	☐	☐	☐	☐	☐	☐

What is your age?

Q44 What gender do you identify as?

- ☐ Male
- ☐ Female
- ☐ Non-binary / third gender
- ☐ Prefer not to say

Q45 Which race or ethnicity best describes you?

- ☐ American Indian or Alaskan Native
- ☐ Asian / Pacific Islander
- ☐ Black or African American
- ☐ Hispanic
- ☐ White / Caucasian
- ☐ Multiple ethnicity / Other (please specify)

ACADEMIC VITA

Alexa (Lexi) Prince

www.linkedin.com/in/alexaj-prince/

EDUCATION

The Pennsylvania State University, Smeal College of Business
Schreyer Honors College
Bachelor of Science in Marketing

University Park, PA
May 2025
Dean's List: 7/7 Semesters

PROFESSIONAL EXPERIENCE

Cencora

Good Neighbor Pharmacy Marketing Intern

Conshohocken, PA
June 2024 – August 2024

- Created B2C social media and content deliverables on various platforms to support clients of the Good Neighbor Pharmacy Program, a network of over 4500 independently owned pharmacies supported by Cencora.
- Collected post performance data via Excel and synthesized content into PowerPoints for vendor presentations.
- Educated over 60 independent pharmacy owners in the Marketing Lab at Good Neighbor Pharmacy's annual trade show about B2C social media engagement through Instagram Reel information and demonstration.

Nittany Lion Consulting Group

Engagement Manager on Calibre Biometrics Engagement

University Park, PA
August 2023 – December 2024

- Lead and delegate a team of 4 to create a market analysis report deliverable for a biotechnology startup company, determining viable markets based on profitability, feasibility, and legal and regulatory components.

Associate on Simply Health Rx Engagement

December 2023 – April 2024

- Served on a client engagement with 2 other team members for Simply Health Rx (local spa business) to create value proposition, marketing plan, and marketing timeline deliverables and deliver value to the client.

The Pennsylvania State University

Undergraduate Research Assistant Position with the National Science Foundation

University Park, PA
February 2022 – Present

- Utilize Excel in collection, analysis, and presentation of mentor, organizer, and student qualitative data within innovation competitions and programs to improve these experiences and facilitate STEM student success.
- Conduct Zoom interviews from over 20 universities and perform qualitative data analysis utilizing NVivo coding software to present findings at conferences through scholarly papers and informative posters.

CAMPUS INVOLVEMENT

Penn State American Marketing Association

Program Manager: Marketing Analytics Division

University Park, PA
September 2023 – January 2024

- Lead team of 6 in a Tableau data analyzation software presentation to be evaluated through a client-facing lens.

Student Government Association

Secretary

Penn State Berks Campus
August 2022 – May 2023

- Act as a liaison between the student body and Student Government while maintaining detailed meeting records.
- Participate in larger government meetings, writing over 3 pieces of legislation impacting Penn State Campuses.

Honors Club

Treasurer

Penn State Berks Campus
September 2022 – May 2023

- Managed budget of about \$5000 to determine and record financial aspects of events and service opportunities.
- Kept detailed financial records utilizing Excel to provide monthly financial status reports to club supervisors.

Penn State Math Department

Math 22 Teaching Assistant

Penn State Berks Campus
January 2022 – May 2022

- Answered questions, reviewed concepts weekly in the classroom setting, hosted review sessions to ensure student success, and facilitated communication between students and the professor to promote student learning.

HONORS, SKILLS, INTERESTS

Honors: Penn State Berks Honors Program, Schreyer Scholar, Recipient of the President Sparks Award, Franco Undergraduate Research Endowment, and the 2023 Engineering, Business, and Computing Young Investigator Award

Skills: Proficient in Microsoft Office Suite, Google Suite, NVivo, Salesforce platform, SOCi CRM, and Canva

Interests: Women in Business, Hiking, Yoga, Track and Field, Fashion, Coffee, Dance, Baking, Poetry, Reading