Applying Behavioral Contagion Theory to Examining Young Adults' Participation in Viral Social Media Challenges

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Viral social media challenges have erupted across multiple social media platforms. While social media users participate in prosocial challenges designed to support good causes, like the Ice Bucket Challenge, some challenges (e.g., Cinnamon Challenge) can also potentially be dangerous. To understand the influential factors, experiences, and reflections of young adults who participated in a viral social media challenge in the past, we conducted interviews with 30 college students (ages 18–27). We applied behavioral contagion theory as a qualitative lens to understand whether this theory could help explain the factors that contributed to their participation. We found that behavior contagion theory was useful but not fully able to explain how and why young social media users engaged in viral challenges. Thematic analyses uncovered that overt social influence and intrinsic factors (i.e., social pressure, entertainment value, and attention-seeking) also played a key role in challenge participation. Additionally, we identified divergent patterns between prosocial and potentially risky social media challenges. Those who participated in prosocial challenges appeared to be more socially motivated as they saw more similarities between themselves and the individuals that they observed performing the challenges and were more likely to be directly encouraged by their friends to participate. In contrast, those who performed potentially risky challenges often did not see similarities with other challenge participants, nor did they receive direct encouragement from peers; yet, half of these participants said they would not have engaged in the challenge had they been more aware of the potential for physical harm. We consider the benefits and risks that viral social media challenges present for young adults with the intent of optimizing these interactions by mitigating risks, rather than discouraging them altogether.

CCS Concepts: • **Human-centered computing → HCI theory, concepts and models**;

Additional Key Words and Phrases: Social media, viral challenges, behavioral contagion

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1 INTRODUCTION

Social media challenges have persuaded many online users—particularly youth and young adults—to perform unconventional behaviors, such as jumping out of a moving car while dancing to a popular music hit (i.e., KiKi Challenge), in the absence of a direct incentive [19]. A viral social media challenge is an activity performed by an individual or group that is typically filmed, uploaded to a social media website, and promoted for the purpose of achieving a specific goal [1, 2]. The rapid diffusion of social media posts containing viral challenges has, in turn, triggered the spread of the unconventional behaviors encouraged by these challenges. Social media serves as a highly effective medium for viral challenges to generate and flourish rapidly as ordinary users can act as both the pioneers and propagators of user-generated content in the online realm [18, 23, 28, 32]. As such, viral social media challenges present an interesting case study for applying behavioral contagion theory, which attempts to explain how an individual's behavior can be indirectly influenced by observing the behavior of others [35, 47]. Further, it attempts to explain how this behavior can then be propagated (like a disease or virus) through the masses [35, 47].

Viral social media challenges are a relatively new internet phenomenon that can promote positive online interactions but also may cause potential harm to those who participate in them. One of the most popular viral social media challenges, the Ice Bucket Challenge, received upwards of 17 million participants and as many as 10 billion views online [52]. The Ice Bucket Challenge was rooted in philanthropy and advocacy, encouraging monetary donations to the **Amyotrophic Lateral Sclerosis (ALS)** Foundation for advancing research efforts on the neurodegenerative disease [52]. Challenges like the Ice Bucket challenge can be considered prosocial, or socially beneficial, to challenge participants and others [5]. However, other popular challenges are potentially risky, as they promote engagement in behaviors that could be dangerous to those who perform them. For example, the Cinnamon Challenge involves swallowing a spoonful of ground cinnamon in under one minute without the use of water or fluids. While this behavior may seem relatively benign at first glance, it has led to the accidental aspiration of cinnamon into several participants' lungs, causing choking and sometimes death [17]. Thus, a potential negative consequence of the virality of social media challenges is that they promote risky behaviors that intentionally or unintentionally lead to self-harm. Given the popularity of this online phenomenon, broader research on viral social media challenges is warranted. Our research makes a unique contribution by studying both prosocial and potentially risky viral social media challenges through the theoretical lens of behavioral contagion [35, 47]. As such, our research sets out to answer the following high-level research questions:

- **RQ1:** *How and to what extent does behavioral contagion help explain why young adults participate in viral social media challenges?*
- **RQ2:** *(a) What factors beyond contagion effects motivate young adults to participate in viral social media challenges? (b) How might we optimize the benefits versus the risks young adults experience after participating in viral social media challenges?*

To answer these questions, we conducted 30 semi-structured interviews with college students (ages 18–27) at two large public universities in the United States. Participants had to have previously participated in at least one viral social media challenge. We qualitatively analyzed the

interviews using a combined inductive and deductive approach [8, 29, 33]. To answer RQ1, we applied the theoretical lens of behavioral contagion theory to understand the factors that influenced young adults to participate in these challenges [35, 47]. Our data also revealed some distinct differences between risky versus prosocial challenges. For RQ2, we used a grounded approach to identify emergent themes that contributed to challenge participation beyond the dimensions outlined in the theory of behavioral contagion. We also examined how young adults reflected on their past participation to understand their regrets and what they might have done differently, as well as to identify risk mitigation strategies that might be effective in reducing their desire to engage in potentially harmful behaviors.

Overall, we found adequate support for behavioral contagion effects of viral social media challenges (RQ1); however, different patterns emerged for prosocial (i.e., Ice Bucket, Mannequin, and Harlem Shake Challenges) versus potentially risky challenges (i.e., Cinnamon and KiKi Challenges). Moving beyond theory (RQ2), we uncovered that social pressure, such as the need for peer acceptance, also played a role in motivating young adults to engage in both prosocial and potentially risky social media challenges, and one-third of our participants expressed regret due to their past participation in viral social media challenges. Knowing both the physical and social risks of participation as well as knowing that not everyone was participating would have made interviewees reconsider their participation.

The unique contribution of our work is that we apply the framework of behavioral contagion theory [47] to understand whether this theory can be a useful tool for understanding why young adults participate in both prosocial and potentially risky viral social media challenges—a relatively novel perspective within the social computing literature. Given the prevalence in which contagion theory emerges as a central theme in the social media virality literature, we qualitatively assessed which facets of social media challenge participation could be explained by behavioral contagion theory. We fill the existing gap in the related works that primarily focused on analyzing social media trace data by interviewing young adults who had first-hand experience participating in one or more viral social media challenges to understand the "whys" and "hows" of their participation in these challenges. Our study is one of the first empirical studies that directly examines the influential factors, experiences, and reflections of young adults who performed a variety of viral social media challenges in the past, with the goal of learning from their experiences to optimize the benefits and minimize the risks associated with such participation. Furthermore, we uncover additional motivations behind why young adults chose to participate in these challenges beyond contagion effects. Finally, we leverage these findings to identify risk prevention strategies that increase the benefits while reducing the potential harm resulting from viral social media challenges. In doing so, we move away from more fear-based narratives that focus primarily on preventing the viral spread of social media challenges. As such, this study speaks to empowering young adults by better understanding their online behavior and supporting their needs.

2 BACKGROUND LITERATURE

A theme among this Social Computing literature is that the benefits and drawbacks of social media use on young adults vary and are dependent on the individual, as well as context and level of use. As such, we study social media usage of young adults from the novel context of engaging in viral social media challenges. In the next section, we synthesize prior literature on virality in social media, in general, and more specifically, regarding the emergence of viral social media challenges.

2.1 Social Media and Virality

Given the way in which user-generated content spreads rapidly through social media, businesses, political organizations, and individuals alike, have had to shift their traditional ideas of top-down

media diffusion to understanding the new "networked culture" that has ultimately transformed how people communicate and information is shared [43]. Thus, many researchers have studied how and why digital content goes "viral" on social media [7, 31, 39]. For instance, Nahon and Hemsley [31] defined virality as the flow of social information from one or more person(s) to many other people, which is then shared simultaneously and over a short period of time to the point that the original message becomes amplified and extends well beyond one's proximate social networks to distant networks. They emphasized the social nature of these information flows between people. In contrast, Berger focused on certain characteristics of viral content, such as the ability to evoke emotion in the observer or the social currency it lends to users who engage with the content, which may contribute to the "contagious" nature of why some content goes viral [7]. Sampson [39] also equated virality to the concept of contagion. In his book, he adapted social contagion to modern-day digital networks and critiqued different conceptualizations of virality. He argued that the biological and medical metaphors at the origin of contagion theory unnecessarily framed virality in a negative light; when in actuality, virality is neither positive nor negative, it is merely how society connects and relates.

A common theme among the virality and contagion literature synthesized above is that it often differentiates between viral content (e.g., a meme), emotions (e.g., public hysteria), and behaviors (e.g., self-harm [12]) and demonstrates how all three are different and can be intertwined. Viral social media challenges are a quintessential example of viral digital content that has emotional aspects but is primarily behavioral, as participants are asked to share their own experience of carrying out a challenge, from dancing outside of a moving car (i.e., KiKi Challenge), dumping a bucket of ice on one's head (i.e., Ice Bucket Challenge), to setting oneself on fire (i.e., Fire Challenge). In the next section, we introduce the literature on viral social media challenges.

2.2 Viral Social Media Challenges

The advent of viral social media challenges can be traced back to 2001 with the introduction of the Cinnamon Challenge, which reached its peak in 2012 [17]. In the Cinnamon Challenge, youth were encouraged to swallow a spoonful of powdered cinnamon in 60 s without any fluids. This challenge has led to a number of documented cases of aspiration and death [17]. Yet, not all viral social media challenges are harmful to their participants; in fact, some can create a positive sense of community and purpose. For instance, millions of social media users came together to raise awareness about ALS with the Ice Bucket Challenge by nominating one another to pour buckets of ice water on their heads in addition to making a monetary donation to the ALS Association. Phing and Yazdanifard's [32] case study on the Ice Bucket Challenge concluded that it was a highly successful social media marketing campaign that occurred at the right time and was driven by word-of-mouth sharing and celebrity influencers. In 2018, Pressgrove et al. [36] conducted a content analysis of social media posts about the Ice Bucket Challenge and found that emotionally arousing videos were most frequently retweeted, favorited, and commented on.

While many viral social media challenges are fun and lighthearted, some that seem innocuous can inherently pose a risk to their participants. As an example, the KiKi Challenge asks participants to dance to a song while walking beside their moving and unmanned vehicle [48]. As a result, the KiKi Challenge has resulted in several injuries, including participants being run over by their car, causing some countries to ban the KiKi Challenge [48]. To make a clear distinction between potentially risky versus beneficial social media challenges, we refer to "prosocial" challenges as actions that facilitate positive interaction with others, including sharing, cooperation, generosity, helpfulness, and/or altruism [5]. In contrast, we consider challenges that could lead to physical and/or psychological harm as "potentially risky" challenges, regardless of whether harm was intentional or unintentional. While the prior works cited help explain why prosocial media

challenges go viral, they do not tell us why individuals would decide to participate in viral social media challenges that have no obvious benefits or could potentially cause harm.

News reports on social media users performing online challenges suggest that most participants appear to be adolescents or young adults—a demographic that may be more impressionable than their adult counterparts [30]. Consequently, Lottridge et al.'s [10] study on third-wave livestreaming found that teens engaged in a wide variety of online challenges, including make-up, mannequin, and dance challenges. Youth live-streamed these challenges not necessarily to reach large audiences but to engage with smaller groups of friends. Wisniewski et al.'s diary study of teens' online risk experiences [34] found that adolescents participated in self-harming behaviors to participate in challenges like the Eraser Challenge (i.e., skin burn caused by a pencil eraser) and the Cinnamon Challenge.

Recently, a group of researchers have studied viral social media challenges from the perspective of digital self-harm and suicide contagion [24, 25, 37]. Pater and Mynatt [21] defined digital self-harm as online activities that lead to or facilitated non-suicidal, yet intentional, self-harm that impaired an individual's physical well-being. Their work highlights how risky behaviors (e.g., eating disorders or cutting) that were once relegated to fringe communities have now become mainstream due to information and communication technologies, such as social media. The public health and psychological literature have established that non-suicidal self-injury can be propagated through social modeling or imitating the behaviors of those we observe [20]. Given the framing of digital self-harm, Khasawneh et al. [25] conducted a content analysis of videos and posts on YouTube and Twitter regarding the Blue Whale Challenge—a controversial social media challenge that proposes 50 self-harming tasks for participants to perform, with the last task dying by suicide [49]. They concluded that the portrayal and propagation of the Blue Whale Challenge contributed to suicide contagion effects among youth and young adults. Similarly, Roth et al. [37] examined how news reports of the Blue Whale Challenge violated suicide prevention safe messaging guidelines, which in turn, could promote suicide contagion effects [30].

Although this prior literature is important and insightful, the Blue Whale Challenge is a unique and arguably extreme example of a highly risky viral social media challenge that should not be generalized to other challenges. Akin to Sampson's critique of the overly negative framing around virality and contagion effects [39], we posit that behavioral contagion exhibited through viral social media challenges can facilitate both positive and negative experiences. Yet, it is difficult to ascertain these differing effects by examining social media trace data and news articles without deeply understanding the motivations and personal experiences of people who partake in such challenges. Further, while prior works have cited contagion theory as a potential explanation of why social media challenges "go viral," to our knowledge, no one has yet applied contagion theory in a systematic way to understand whether and how this theory applies to the novel context of young adults participating in social media challenges. In the following section, we describe how we drew from behavioral contagion theory to ground our empirical work.

3 A THEORETICAL LENS OF BEHAVIORAL CONTAGION

The Facebook emotional contagion study, which found that emotional states can be transmitted indirectly and unknowingly through observing posts made by one's Facebook friends, is likely the most well-known and controversial application of contagion theory in the HCI literature [1, 23, 26, 41]. Yet, understanding if and how *behavior* propagates through social networks is also an emerging area of HCI research. Polansky et al. [35] first coined the term "behavioral contagion" and defined it as a form of social influence in which the behavior of an individual is influenced indirectly by observing the behavior of others. Importantly, the *model* (i.e., the person performing the behavior) need not be directly associated with the *observer* (i.e., person who performed

Table 1. Dimensions of Behavioral Contagion Theory

Dimension	Definition
Approach-Avoidance Gradient with Reduction of Internal Restraints	The ratio between an observer's desire (i.e., approach) or hesitance (i.e., avoidance) to perform an observed behavior.
Characteristics of the Model and Observer	Characteristics of the model, such as social status and perceived similarities, that indirectly influence the observer to adopt the model's behavior.
Observed Consequences to the Model	The perceived outcome of a model's performance of a certain behavior, such as punishment or reward.
Specificity of Response Matching	The extent to which the imitative behavior is the same as the original behavior modeled.

the behavior initiated by the model). Behavioral contagion theory has been widely applied in research to understand decision-making and risk-taking behaviors, particularly in relation to social conformity and peer influence cf., [11, 35, 38, 45, 47]. Further, this theory has proven useful as a theoretical lens used in previous works that have studied the spread of behaviors promoted by social media challenges [24, 25, 37], but it has not yet been systematically evaluated for its applicability to the broad range of prosocial and potentially risky social media challenges that have emerged in the past decade. As such, this theory may provide potential utility for understanding novel social phenomena involving both risky and prosocial decision-making, which includes participation in social media challenges. Thus far, research on behavioral contagion within the context of social media has focused primarily on in-network homophily (or the similarity between connected individuals) and its role in social influence [3, 40]. In contrast, our work is the first to systematically apply behavioral contagion theory to the novel context of viral social media challenges. In the sections below, we describe the key dimensions of behavioral contagion theory that we synthesized to build a conceptual framework and theoretically driven qualitative codebook for analyzing our interview data.

3.1 A Framework of Behavioral Contagion for Viral Social Media Challenges

We identified four dimensions (Table 1) of behavioral contagion theory that serve as the foundation of our analytical framework for evaluating viral social media challenges. The four dimensions include: (1) the Approach-Avoidance Gradient with Reduction of Internal Restraints, (2) Characteristics of the Model and Observer, (3) Consequences to the Model, and (4) Specificity of Response Matching. Below, we describe each dimension of the theory in detail.

3.1.1 Approach-Avoidance Gradient with Reduction of Internal Restraints. Wheeler's [47] theory of behavioral contagion identified the approach-avoidance gradient as an essential component of behavioral contagion theory. The approach-avoidance gradient refers to the ratio that exists between the observer's desire (i.e., approach level) and hesitance (i.e., avoidance level) to perform the model's behavior. Wheeler explained that some hesitance to perform the behavior must exist for behavioral contagion theory to apply, and that the reduction of internal restraints is needed to decrease avoidance levels to a point where the observer desires to, and thus, performs the behavior. If one's avoidance level is much greater than their approach level (i.e., desire), then performance of a behavior is highly unlikely. In contrast, observing a model perform a behavior may reduce internal constraints to the point that desire overrides reluctance [47].

Further, the reduction of internal constraints may be influenced by environmental determinants, such as the density and number of people engaging in a particular behavior [15]. For instance,

Freedman, Birsky, and Cavoukian [15] found that the density of a crowd and the number of crowd members predicted the likelihood of the spread of imitative behaviors (i.e., spontaneous clapping) among crowd members. Additional research has supported this finding, suggesting that the number of models observed performing a specific behavior has been found to increase the likelihood of an observer imitating that behavior [15]. In the context of our study, we first assess whether participants experienced any initial hesitation before performing their respective social media challenge(s), and if so, the factors (e.g., density and number) that lead to a reduction in their internal restraints, which changed their approach-avoidance gradient toward participation. Another factor that may reduce internal constraints and lower the avoidance gradient is the characteristics of the model and observer, which are discussed below.

3.1.2 Characteristics of the Model and the Observer. According to Polansky et al. [35], a model is a person who initiates a behavior that is seen by an observer and later performed by that observer. In building upon Polansky et al.'s [35] empirical work, which first identified the phenomenon of behavioral contagion, Wheeler [47] identified characteristics of the model and observer as key factors in behavioral contagion. Characteristics, such as social status, demographics (e.g., gender and race), the relationship, and similarities between the model and observer influence behavioral contagion outcomes [47]. In online contexts, Aral, Muchnik, and Sundararajan [3] studied behavioral contagion effects and homophily around the adoption of a mobile application by users of a global instant messaging platform. They found that prior work over-estimated the effects of peer-influence and that homophily explained over 50% of the behavioral contagion effects observed in the network. Similarly, characteristics and similarities between models and observers may play a role in the contagion of viral social media challenges.

3.1.3 Observed Consequences to the Model. Another influential factor of behavioral contagion theory is whether the observer sees the model rewarded or punished for their behavior [47]. The observed consequences to the model can influence whether the observer becomes more hesitant to perform the behavior (due to fear of punishment) or more likely to perform the behavior (due to desiring a similar reward). In some cases, however, a lack of punishment may also be considered a reward if the behavior itself has a higher approach-avoidance gradient (i.e., more willingness to perform than hesitancy against performance) [47]. In our case, viral social media challenges are unique in that models often perform the challenge on video and share the video via social media, which allows observers to view multiple models performing the behavior of interest from start to finish. Yet, in some cases, if the consequences of the behavior are not immediately visible to the observer or the video is cut short prior to the model experiencing discomfort or harm, then observers may not have an accurate picture of the consequences incurred from engaging in the challenge.

3.1.4 Specificity of Response Matching. Wheeler [47] also noted that for behavioral contagion to occur, the observer need not carry out the behavior as an exact imitation of the model's performance. In some cases, specific response matching is not possible (e.g., the observer may not have similar resources or be embedded in the exact same context as the model), and by modifying the behavior, this allows the observer to lower their avoidance level and/or fear of performing to the point of action. Therefore, in using behavioral contagion theory as a lens to understand how young adults imitate one another when propagating viral social media challenges, we examine how closely they imitate one another in their performance of these challenges and whether they make modifications to the challenge that change their approach-avoidance gradient in a way that aligns with behavioral contagion theory.

In summary, we created the research framework above based on behavioral contagion theory and contextualized our framework to the novel phenomenon of viral social media challenges [47].

This theoretically derived research framework (Table 1) informed the design of our interview questions (Appendix Table A.1), as well as our qualitative coding scheme for answer RQ1– whether behavioral contagion theory can serve as a useful theoretical lens for understanding why young adults participate in viral social media challenges. Next, we describe our methods.

4 METHODS

4.1 Study Overview

We conducted semi-structured interviews over the span of two months with 30 college students from two large, public universities. Participants had to be 18 years old or older and have participated in at least one social media challenge in the past. A pre-survey was used to determine each subject's eligibility to participate in the study. This survey asked if the participant had ever performed a social media challenge, and if so, asked the participant to provide a brief description of which challenge(s) they performed. We did not specify which social media challenges, only that they had to be considered viral. If a participant completed more than one challenge, then they were asked the same interview questions for each challenge. After eligibility was determined, participants received a consent form that explained the purpose of the study and how the information received from participants was to be used by the researchers. Institutional Review Board (IRB) approval was obtained at both universities before participant recruitment began. Recruitment of participants was accomplished through flyers posted on campus, emails sent to student listservs, and by word-of-mouth. Table A.1 in the Appendix provides a list of sample questions organized by our over-arching research questions and aligned to the dimensions of behavioral contagion theory from our research framework (Section 3). Interview questions queried participants' experience participating in viral social media challenges, including which social media challenge(s) they performed, the influential factors that contributed to their participation, their personal motivations for performing the challenge, how they performed the challenge, and reflections about their participation. At the conclusion of each interview, participants received a $15 Amazon gift card as compensation for their time.

4.2 Data Analysis Approach

Each interview was audio recorded with participants' consent and transcribed verbatim by the researcher who conducted the interview. Interviews were between 15 and 48 min in length. All data collected was stored in a secure, shared folder only accessible by researchers involved in the study. The first author (a psychology student) coded each interview under the advisement of the last author (HCI researcher). After the initial codes and themes were identified, all co-authors worked together to form a consensus on any codes that were unclear, refine the analysis, and frame the results presented below. Given the single primary coder, as well as the iterative and generative process of qualitative sensemaking on unstructured data, we chose to follow local norms within the HCI community and not calculate a metric of inter-rater reliability [33]. In our codebooks (Tables A.2 and A.3 in the Appendix) and throughout the presentation of our results, we present illustrative quotes that can be evaluated by our readers to assess the face validity of our coding process. To answer RQ1, we first used a top-down approach to inductively code our interview data based on the theoretical dimensions of behavioral contagion theory that we outlined in our research framework (Section 3). To address RQ2, we conducted a thematic analysis to identify participants' motivations that went beyond behavioral contagion theory and to understand their post-challenge reflections on their past participation. We describe these qualitative approaches in detail below.

4.2.1 Applying Behavioral Contagion Theory. To determine whether behavioral contagion theory can be a useful framework for understanding young adults' participation in viral social media

challenges (RQ1), we first coded our interview data based on the dimensions of our research framework in Section 3. Our final codebook, aligning the theoretical dimensions of our research model to our over-arching themes and underlying codes, is shown in Table A.2 in the Appendix. We also provided an illustrative quotation representative of each theme. While we used a top-down approach to align our codes with behavioral contagion theory, we used an open-coding process to generate our codes from the interview data. We first coded for the participants' **Approach-Avoidance Gradient with Reduction in Internal Restraints.** We did this by identifying the sources that could contribute to a participant's hesitancy (or lack thereof) toward performing their challenge. The themes (and codes) that we identified related to this theoretical dimension of behavioral contagion theory were (1) *Perception of Challenge* (Positive, Negative, or Neutral) and (2) *Environmental Determinants* (Density and Number) associated with the participant's perceived viral reach of the challenge [47]. Next, the theoretical dimension **Characteristics of the Model and Observer** focused on the dynamic between the participant (i.e., Observer) and the person they first saw perform the challenge (i.e., Model).

As such, we coded for the participant's: (1) *Relationship to Model* (Friend, Acquaintance, or No Relationship) and (2) *Perceived Similarities* (Age, Gender, Race/Ethnicity, School/Location, Performance of Challenge, or Motive). For **Observed Consequences to the Model,** we coded for *Observed Consequences* (Physical, Social, or None) that participants recalled happening to those who they saw performing the challenge prior to their own participation. The last theoretical dimension, **Specificity of Response Matching**, included: (1) *Modification of Challenge* (Group Participation or Reduced Risk) and (2) *Sharing Behavior* (Posted on Social Media or Participated Offline). In this case, we uncovered that some participants engaged in viral social media challenges without sharing their participation via social media. Next, we describe how we conducted our thematic analysis, to uncover emergent themes that went beyond those that could be aligned with behavioral contagion theory.

4.2.2 Understanding Viral Social Media Challenges Beyond Behavioral Contagion. After the theory-driven coding process, a thematic analysis was performed to identify patterns or trends that emerged that were not well-aligned with theory and contributed to answering RQ2 [8]. First, we examined **Motivations for Participation** that were unrelated to the *Approach-Avoidance Gradient* needed for behavioral contagion to occur [47]. Participant motivations that emerged from our interviews included those beyond the intrinsic factors outlined in behavioral contagion theory, which included: (1) *Social Pressure* (Direct Encouragement, Peer Acceptance), (2) *Attention-seeking* (Get Noticed, Get Recognition), and (3) *Entertainment Value* (Amusement, Curiosity). Unlike behavioral contagion, which occurs at more of a subconscious level, these motivations were more overt and socially motivated. We also examined **Participants Reflections** on their past behavior, which uncovered (1) *Post-Challenge Assessments* (No Regrets, Regrets) and (2) *Possible Prevention Strategies* (Knowing Risks, Damage to Social Image, Density/Number) for mitigating potential risks. These included knowing more about the risks involved and not giving in under peer pressure, as well as some factors that aligned to environmental determinants of behavioral contagion theory (i.e., density and number). We include our thematic codebook with illustrative quotes for answering RQ2 in Table A.3 in the Appendix. Next, we explain why we chose to differentiate between prosocial and potentially risky challenges when presenting our results.

4.2.3 Differentiating between Prosocial versus Potentially Risky Challenges. When first analyzing our interview data, we did not differentiate between prosocial and potentially risky challenges. However, after coding our data, we realized that groups of challenges exhibited observably different patterns. Therefore, we reflected on why this might be the case and what to do about it. One key

Table 2. Social Media Challenge Descriptions

Challenge Name	Challenge Description
ALS Ice Bucket Challenge	Participants pour a bucket of ice water over their head and encourage onlookers to make a monetary donation to the ALS Association (Prosocial)
Cinnamon Challenge	Participants attempt to swallow a tablespoon of ground cinnamon in under 60 s without drinking any liquids (Potentially Risky)
Harlem Shake Challenge	Participants do a wild dance to a specific song, either alone or in a large group (Prosocial)
KiKi Challenge	Participants perform a dance alongside a moving vehicle with the vehicle's door open (Potentially Risky)
Mannequin Challenge	Participants stand still in a pose while another person films them, usually with a song playing in the background (Prosocial)

difference was participants' differing perceptions of the challenges themselves—some challenges were cast in a positive light, while others were viewed more negatively. For instance, participants generally felt that the Ice Bucket Challenge was for a good cause and that the Harlem Shake and Mannequin Challenges were fun and harmless activities in which to share a good laugh with their friends. Such activities promoted sharing and social connectedness among friends. Therefore, we categorized the Ice Bucket, Mannequin, and Harlem Shake Challenges as "prosocial" challenges based on Batson and Powell's definition of prosocial behavior [5], which was presented earlier. In contrast, participants acknowledged that the Cinnamon and KiKi Challenges were dangerous or at least posed some level of inherent risk to the participants. Since the potential harm was self-inflicted, rather than inflicted on others (which would be "antisocial" behavior, the opposite of prosocial behavior), we categorized the Cinnamon and KiKi Challenges as "potentially risky" [5]. Participants' risk appraisals directly impacted their approach-avoidance gradient such that riskier challenges required more avoidance reduction to warrant participation. We use this categorization of prosocial versus potentially risky challenges throughout the presentation of our results. In the next section, we present the results of our study. A brief explanation of each social media challenge that our sample of participants performed is outlined in Table 2.

5 RESULTS

We first report on the characteristics of our sample, followed by our results, which are organized by our research questions.

5.1 Participant Profiles

As shown in Appendix Table A.4, we interviewed 30 participants, which included 15 college students at each university. Both universities are in the Southeastern United States but in different states. Participants were residents of Florida (56%), South Carolina (37%), North Carolina (3%), Pennsylvania (3%), and Virginia (3%). The majority of participants were female (77%), and we did not find any differences in the frequency of prosocial or risky challenges performed based on gender. The ages of participants ranged from 18 to 27 years old with an average age of 19.7 years of age. Most participants identified as White or Caucasian (43%), followed by Black/African American (27%), Hispanic/Latino (17%), Asian/Pacific Islander (10%), and multiethnic (3%). Almost all the participants reported using social media more than once a day (97%); only one participant reported that they visit social networking sites only once a week. The most common challenge performed by participants was the Ice Bucket Challenge (47%, N = 16), followed by the Cinnamon Challenge

Table 3. Behavioral Contagion Differences between Prosocial vs. Potentially Risky Challenges

Behavioral Contagion Theory	Prosocial Challenges	Potentially Risky Challenges
Approach-Avoidance Gradient with Reduction in Internal Restraints	**56% (N = 10)** had some initial reservations about the challenge. **61% (N = 11)** thought thousands to millions were performing challenge. **17% (N = 3)** watched more than 50 posts prior to participation.	**100% (N = 16)** had some initial reservations about the challenge. **56% (N = 9)** thought thousands to millions were performing challenge. **25% (N = 4)** watched more than 50 posts prior to participation.
Characteristics of the Model and Observer	**67% (N = 12)** had an existing social relationship with their model. **89% (N = 16)** saw similarities between themselves and model.	**13% (N = 2)** had an existing social relationship with their model. **38% (N = 6)** saw similarities between themselves and model.
Observed Consequences to Model	**11% (N = 2)** observed negative consequences to the model. **89% (N = 16)** observed positive consequences to the model.	**82% (N = 13)** observed negative consequences to the model. **18% (N = 3)** observed positive consequences to the model.
Specificity of Response Matching	**44% (N = 8)** modified their challenge participation. **100% (N = 18)** shared via their participation via social media.	**50% (N = 8)** modified their challenge participation. **75% (N = 12)** shared their participation via social media.
Additional Motivations	**94% (N = 17)** were directly encouraged by peers outside of social media to participate. **67% (N = 12)** said attention-seeking played a role in why they participated. **43% (N = 6)** saw participating in the challenge as a form of entertainment.	**6% (N = 1)** were directly encouraged by peers outside of social media to participate. **36% (N = 6)** participated because they sought peer acceptance. **44% (N = 7)** said attention-seeking played a role in why they participated. **57% (N = 8)** saw participating in the challenge as a form of entertainment.
Post-Challenge Assessment	**44% (N = 8)** expressed at least some regrets about their participation. **39% (N = 7)** said knowing more about the risks could have prevented their participation. **28% (N = 5)** said that knowing participation could damage their social reputation would have deterred their participation.	**31% (N = 5)** expressed at least some regrets about their participation. **50% (N = 8)** said knowing more about the risks could have prevented their participation. **25% (N = 4)** said that knowing participation could damage their social reputation would have deterred their participation.

(24%, N = 8), KiKi Challenge (24%, N = 8), Mannequin Challenge (3%, N = 1), and Harlem Shake Challenge (3%, N = 1). Based on our "prosocial" versus "potentially risky" classification, 50% (N = 15) of participants engaged in prosocial challenges, 43% (N = 13) participated in a potentially risky challenge, and 7% (N = 2) participated in both a prosocial and potentially risky challenge. Some participants (i.e., P6, P7, P16, P18) participated on multiple platforms, while P22 participated in the Cinnamon challenge but did not share it via social media. Three of our participants (i.e., P11, P12, P13) performed multiple challenges. Therefore, in our results, we coded for the unique experiences for each challenge, rather than using the person as our unit of analysis. As such, the percentages when reported in this article are based on the 34 challenges (18 prosocial versus 16 potentially risky) performed by our participants. Table 3 summarizes the differences we identified between prosocial and potentially risky social media challenges based on our qualitative analyses, which is explained in more detail in the remainder of our results.

5.2 Using Behavioral Contagion Theory to Understand Why Young Adults Participate in Viral Social Media Challenges (RQ1)

The results discussed in this section directly pertain to our analysis of the interview data using our research framework, which is aligned to behavioral contagion theory (Section 3). Overall, we found that behavioral contagion theory was useful in understanding the influences that contribute to young adults' decisions to participate in viral social media challenges. However, we also identified some ways in which the dimensions of behavioral contagion theory differed between prosocial versus potentially risky challenges. We summarize these commonalities and differences in Table 3. First, performers of potentially risky challenges seemed to have steeper approach-avoidance gradient, such that challenge participants sought out multiple models and studied how the challenge was performed prior to participating. Second, an existing relationship with or similarity to the model did not seem to matter as much to these participants. Third, even though participants observed negative consequences to their model(s), these negative outcomes were outweighed by the social benefits perceived with fitting in with the crowd. Fourth, participants often modified the challenge to reduce risk, and even though most shared their participation via social media, some performed potentially risky challenges privately. We unpack these keys findings in more detail in the sections that follow.

5.2.1 The Approach-Avoidance Gradient with Reduction of Internal Restraints. The approach-avoidance gradient implies that the observer of a behavior experiences some hesitance before attempting to imitate the behavior. Then, a combination of factors works to overcome this hesitance (i.e., reduce the internal restraints) in the observer to replicate the model's behavior [47]. Related to this initial hesitancy, we first examine participants' *Perception of the Challenge*, or whether participants perceived the challenge positively or negatively prior to their participation. Overall, 29% (N = 10) challenge performers initially held positive feelings toward their challenge, 35% (N = 12) were neutral, 6% (N = 2) felt negative, and 24% (N = 8) of the challenges were viewed in a conflicting light. For the prosocial challenges that posed less of an inherent risk to participants, almost half of the interviewees reported a positive perception of the challenge. For instance, Ice Bucket Challenge participants stated that the altruistic premise of the challenge cast both the model and the challenge in a positive light:

> *"They were actually helping the community by raising awareness. They were looked at as if they were doing something good."* —P4, Ice Bucket Challenge

Similarly, for the Harlem Shake Challenge, participants often mentioned that the overall tone of the videos shared online, in addition to their own experiences, were that of positive feelings. Even though these participants saw prosocial challenges as mostly a positive activity, some still expressed initial hesitance in performing the challenges due to feelings of embarrassment or stage fright in recording their performance on video and sharing it via social media:

> *"I'm pretty sure I wasn't even seen, 'cause there were 80 people in a classroom. . . I mean, I was trying not to be seen on the camera."* —P23, Harlem Shake Challenge

Yet, the perceptions of prosocial challenges were not always positive. In fact, over half of our interviewees had initial reservations about these challenges. For example, P1 described their initial impression of the Ice Bucket challenge as stupid:

> *"Well at first, I was like, why are people dumping water over their head? Like, it seemed stupid to me. I mean, truthfully, it's still, like, I don't get it, but. . . but yeah, I think it was more like, why are people doing this?"* —P1, Ice Bucket Challenge

In contrast, potentially risky challenges were more often viewed in a conflicting light, as neutral, or negatively. Participants acknowledged the inherent risks posed by the challenges or characterized the challenges as "*dumb*" but "*funny*." For instance, most KiKi Challenge participants reported hearing both favorable and unfavorable commentary about the challenge, depending on how it was performed:

> *"I mean, if they did it safely, then just like, 'oh, like, they're a good dancer' or 'it was funny'. But if they were doing it in a dangerous way, like oh, you know, like, 'what an idiot, be safer', or 'that's stupid'."* —P17, KiKi Challenge

Only two participants of the Cinnamon Challenge perceived the challenge as completely negative, rather than in a neutral or conflicting light. Overall, prosocial challenges were perceived more favorably than potentially risky challenges. Yet, in both cases many challenge participants expressed initial hesitancy to perform the challenge. Therefore, we can reasonably conclude that the approach-avoidance gradient of behavioral contagion theory was applicable to both prosocial and potentially risky social media challenges. Additionally, potentially risky challenge participants likely had a higher level of internal restraints toward their challenge due to their higher level of initial hesitancy; therefore, they likely required more reduction in these internal restraints. In summary, the approach-avoidance gradient for performing potentially risky challenges was likely steeper than for prosocial challenges.

Next, we assessed *Environmental Determinants* that served to change participants' approach-avoidance gradient by reducing internal restraints. Specifically, we looked at the *Perceived Viral Reach* of the challenge in terms of the density and number of models our participants observed before performing the challenge. In terms of density, almost all interviewees were aware that people outside of their immediate vicinity were participating in their respective social media challenges. When asked to quantify, the most common response for both prosocial and potentially risky challenges was "*thousands*" of people, followed by "*millions*" and "*hundreds.*" A couple of participants who performed prosocial challenges, specifically the Harlem Shake and Ice Bucket, felt that almost every social media user was also participating in their respective challenge:

> *"I mean, that was the year when it, like, went viral probably and everyone was doing it."* —P23, Harlem Shake Challenge

This *Perceived Viral Reach* highlights that the increased presence of challenge posts on social media platforms may have led to the perception of social normalcy surrounding prosocial challenges; therefore, this may have lowered any initial hesitance a participant may have experienced in partaking in the challenge. In contrast, only one participant who performed a potentially risky challenge was under the impression that "*everyone*" was joining in on the trend. Yet, this participant waited over a month to perform the challenge. They first sought out videos of people performing the challenge to observe as many people as possible before they made their attempt:

> *"Oh, a lot. I was looking at all the different types, because so many people had different styles and stuff. I think it was about maybe a month or so before I did it."* —P6, KiKi Challenge

This highlights a nuance in behavioral contagion theory when applied to social media, rather than physical crowds; the observed behavior can be recorded and publicly shared, and thus, can be sought out and observed repeatedly once performed by an initial model.

In terms of the number of social media posts participants were exposed to before they made their decision to perform the challenge, the least viewed was *zero*, and the most posts viewed were *at least 50*. Almost all participants across prosocial and potentially risky challenges viewed

at least one post of the challenge before performing it. The most common level of exposure for both prosocial and potentially risky challenge participants was between 1 and 25 posts:

> *"Probably, like, a weeks' worth. I was on social media and I was consistently seeing it every day. I would see, like, three to four different challenges a day."* —P30, KiKi Challenge

There were also some participants in the prosocial and potentially risky groups that watched more than 50 posts before attempting their challenge. This may point to a higher initial hesitancy toward their challenge, which then required a greater reduction of hesitance in the participant to perform the behaviors required. It also serves to reinforce the notion that *Environmental Determinants* (density and number of challenge performers) played a role in changing the *Approach-Avoidance Gradient* for both prosocial and potentially risky challenges. Next, we present findings related to the characteristics between the model and the observer.

5.2.2 Characteristics between the Model and the Observer. This part of our analysis aimed to understand the relationship between the person that the participant observed perform the challenge (i.e., Model) and the participant themselves (i.e., Observer). Regarding the observer's *Relationship to Model*, more than half of the challenges were introduced to their respective participants by unknown social media users. In other words, participants had no relationship to or knowledge of their model before observing their media post of the challenge. In these cases, interviewees often explained that they saw the video or post simply because it went viral on social media. Participants who had no prior knowledge of their model usually stumbled upon this person through their regular use of social media.

When comparing prosocial to potentially riskier challenges, a different pattern emerged: Participants in the prosocial challenge category commonly reported being friends with their model, while it was less likely for risky challenge participants to have had a relationship to their model. Prosocial challenge participants often referenced their friends when discussing how they were introduced to the challenge:

> *"I saw my friend post one with her family, and it was like, they were in the middle of dinner."* —P12, Mannequin and Ice Bucket Challenge

In contrast, interviewees who participated in the Cinnamon and KiKi challenges often reported coming across the challenge randomly on a social media platform, therefore having no prior knowledge of or relationship to their model. For instance, a Cinnamon Challenge participant recounted seeing a compilation of YouTube videos of people participating:

> *"It was either a video that I saw on YouTube, or a compilation of YouTube videos that I saw on television. There were, they were videos online of people filming themselves."* —P14, Cinnamon Challenge

Similarly, those who participated in the KiKi Challenge were commonly introduced to the challenge while scrolling through their newsfeed on a social media platform. Challenges that posed a higher risk to participants were usually introduced through social media posts from strangers, whereas prosocial challenges were often introduced through friends or acquaintances.

Across both groups, 65% (N = 22) of our participants could identify at least one *Perceived Similarity* between themselves and their models. Yet, when analyzing our data based on the different categories of challenges, most participants who reported similarities belonged to the prosocial challenge group, rather than the potentially risky challenge group. Only a small number of prosocial challenge participants could not identify any similarities between themselves and their model,

whereas a greater number of participants who performed the Cinnamon and KiKi Challenges failed to report any similarities with their model. Similarities that were reported by prosocial challenge participants usually related to personal characteristics that the individuals shared with the interviewee (e.g., school/geographic location (50%), age (39%), gender (28%), or peer group (28%)). The most common similarity was the school that they attended:

> *"We were in the same grade. We weren't necessarily close, but I did know her."* —P12, Mannequin and Ice Bucket Challenge

The statement above was common amongst prosocial challenge participants and aligns with our earlier finding that models of prosocial challenges were often friends or family members of the participant. This group also had a larger variation of responses, with some participants alluding to characteristics based on race/ethnicity, religion, personal interests, and motivations to perform the challenge. For instance, the interviewee below highlighted that they shared the same religion, race, and socioeconomic status with the person who encouraged them to participate in the Ice Bucket Challenge:

> *"Most of my friends were white, middle-class Christian families. So, that's most of the people I saw doing it."* —P21, Ice Bucket Challenge

For the prosocial challenges, we observed a closeness between the interviewee and the person who encouraged them to participate in the challenge, which was usually framed as "fun" or "for a good cause." This may suggest that one reason prosocial challenge participants engage in behaviors promoted by their model is because of the multiple commonalities they share, which may have lowered their hesitance to perform the challenge:

> *"We have a lot of similarities. We've been friends for a long time. So, like, we're both very caring and compassionate and wanting to help people. And we're both really outspoken about certain things and we wanted to raise awareness for this. And we went to the same school."* —P25, Ice Bucket Challenge

The absence of *Perceived Similarities* between the model and observer was more common with participants who performed the Cinnamon and KiKi challenges. For those that did report similarities, they were usually based upon the similarity between the actions that were carried out when performing the challenge, or their shared interest in the challenge itself. Rather than recognizing similarities based on personal identity, this group of participants rarely thought of their models as anything beyond a visual representation of how the challenge should be performed or the consequences that arose because of participation. For example, P7 reported that the only similarity she saw between herself and her model was their performance of the KiKi challenge.

> *"I would say the type of dance he did, like the choreography. I think that would definitely be similar. The part of the song that we danced to, definitely similar."* —P7, KiKi Challenge

Age, gender, and geographic location/school were reported similarities from potentially risky challenge participants, but at a lower frequency compared to the prosocial challenge participants.

Overall, these results suggest that the type of model for potentially risky challenges does not hold a significant amount of influence on the observer's decision to perform a social media challenge. It could also mean that observers are drawn to the actions promoted by the challenge, rather than the type of person who performs the challenge. In the case of prosocial challenges, while behavioral contagion theory traditionally refers to the observable characteristics of the model that increase the observer's susceptibility to contagion, this was less relevant, since direct

social influence by family and friends seemed to play a stronger role than that of strangers (See Section 5.3 on the factors of social influence beyond behavioral contagion theory). In the next section, we examine the observed consequences participants reported witnessing their models experience prior to participating in the challenge themselves.

5.2.3 Observed Consequences to the Model. Next, we discuss the physical and social consequences that our interviewees said they observed their models encountering because of challenge performance. Over half of the participants in this study did not report seeing any overtly graphic content (e.g., blood, physical wounds, or psychological trauma) in the videos where their models carried out the challenge. Yet, across both prosocial and potentially risky challenges, 32% (N = 11) participants reported the presence of media posts containing some depiction of harm or discomfort to the model. Interviewees from the potentially risky challenge group made up 82% of that total, particularly those who performed the KiKi Challenge. This group of participants spoke about negative physical consequences—like falling—that occurred when the KiKi challenge was performed alongside a moving vehicle:

> *"Some of the posts I saw, yes. Some of the people jumping out of the cars, like, that's kind of dangerous. I saw some people fall; it was a little much. Then, I definitely had read articles when it kind of died down, like, 'there's this dangerous challenge going around'."* —P30, KiKi Challenge

A quarter of the Cinnamon Challenge participants reported viewing a post that contained harm to the model. For instance, P13 performed three different challenges and only identified the Cinnamon Challenge as seeming physically painful to the model.

A smaller percentage of Ice Bucket Challenge performers watched a media post that resulted in some physical harm to the model. Yet, these negative consequences were usually due to the model exaggerating the actions encouraged by the challenge, rather than performing them as described by the challenge. In these rare cases, however, participants who saw a model get hurt also saw numerous posts that did not depict any negative consequences to the model. Therefore, these positive observations could have outweighed the negative. Further, many participants felt that turning down a challenge—particularly a prosocial challenge—could create negative social consequences, which in turn made the participant feel pressured into performing a challenge:

> *"I don't think anyone turned down the challenge. Like, that wouldn't probably look great… if someone challenged you and you didn't want to do it. Like, come on. It's for ALS."* —P18, Ice Bucket Challenge

In contrast, concern about the negative social consequences of performing a challenge was not present for potentially risky challenges.

Participants from both prosocial and potentially risky challenges also often observed positive physical and social consequences to their models, which helped overcome the negative consequences. Positive physical consequences, such as the fun the model experienced because of challenge performance, were present in the Harlem Shake, KiKi, Ice Bucket, and Cinnamon Challenges. Positive social consequences were also observed by Mannequin, Cinnamon, Ice Bucket, and KiKi Challenge participants. Participants perceived their models as being accepted by the crowd and felt that performing the viral social media challenge would allow them to reap the same benefits. We discuss positive social benefits of participation more in Section 5.3.

In summary, prosocial interviewees rarely observed negative physical consequences to the model but often perceived negative social consequences from not performing the challenge. Participants in the potentially risky challenge group were aware of the negative physical outcomes of the challenges they performed but were not concerned with the potential social repercussions.

Regarding behavioral contagion theory and the approach-avoidance gradient, both challenge groups experienced hesitations that were eventually overshadowed by their observations of the positive observed consequences to their model. For prosocial challenges, potential negative social consequences of not performing the challenge led to a fear of punishment from their social circle if they refused to perform the challenge. The positive physical (i.e., entertainment, fun) and social (i.e., positive social image) consequences their models experienced also reduced any initial hesitance they experienced. Potentially risky challenge participants were initially hesitant due to the observed negative physical consequences their model endured; yet this hesitance was also overpowered by the potential for positive physical (i.e., entertainment, fun) and social (i.e., acceptance from peers) rewards of participation. The next section evaluates the extent to which participants imitated the observed behavior of the model.

5.2.4 Specificity of Response Matching. Next, we discuss the *Specificity of Response Matching*, or how closely participants replicated the model both in performance of the challenge and their sharing behavior. We found that participants often made explicit decisions on whether to perform the challenge as prescribed and whether they contributed by propagating the challenge through transmission within their social networks. For *Modification of Challenge*, 38% participants reported that they performed the challenge as closely as they had seen online. Yet, 68% of participants took a different (e.g., safer or more interesting) approach when performing their social media challenge. For instance, almost half of prosocial challenge participants were most likely to execute the challenge in a unique way:

> *"I actually did that in my gym class, so that was interesting... We were all just sitting in our gym, and even the teacher was a part of it. And someone recorded it and we were all left doing different things, like, using gym equipment."* —P12, Mannequin and Ice Bucket Challenges

In most cases, these prosocial challenge participants made performative changes that made the challenge more personalized, interesting, showy, or socially engaging. Further, most Ice Bucket Challenge participants did not donate money to the ALS Foundation, which was supposed to be a key aspect of the challenge [40]. In this way, it seemed that the social recognition participants received because of performing the philanthropic challenge was beneficial to the participant, but not necessarily to the cause.

Half of the participants that engaged in a potentially risky challenge often purposely altered their performance to diminish the risk of negative consequences. This was especially common among those who participated in the KiKi Challenge, where they filmed themselves performing the dance but found ways to do it safely. Most of these participants were aware of the dangers associated with performing the KiKi challenge as specified and made the decision to perform the challenge under safer circumstances, such as performing it in a safe location, rather than alongside a moving vehicle:

> *"Woah, no, no, no. I did not do it outside of a car. I did it actually in Boston, on like a... a dock. I did it like, by the water outside. I didn't do it, like, outside of a car."* —P6, KiKi Challenge

Only one out of the eight participants who performed the KiKi Challenge did it as specified (i.e., outside of a moving vehicle). In contrast, all the Cinnamon Challenge participants performed the challenge exactly as they had observed on social media:

> *"Seeing my friends who did it first and then comparing that to videos, it was all pretty similar."* —P22, Cinnamon Challenge

In this case, the specificity of response matching for the Cinnamon Challenge may be because the only objective of the challenge was to swallow a spoonful of cinnamon; therefore, leaving very little room to alter the performance of the challenge. In contrast, the KiKi Challenge consisted of two parts (a dance and a moving vehicle), which allowed participants to pick and choose the actions to perform. By modifying the KiKi Challenge, participants were able to reduce their avoidance level and approach the challenge in a way that made them feel safer when reducing the internal restraint against performing the challenge.

Regarding *Sharing Behavior*, most participants recorded themselves performing their challenge and uploaded the recording to one or more social media platforms. All but one of the prosocial challenge participants posted on social media once they recorded themselves doing the challenge:

> *"It was something I posted for everyone to see on Facebook. And yeah, people saw that I was participating and after doing the challenge, I had to challenge other people, and I knew that they would do it as well."* —P2, Ice Bucket Challenge

This provides further support for our interpretation that performing a prosocial media challenge was a convenient way for individuals to model their social standing by displaying their participation in a viral challenge. Prosocial challenges were also more likely to be performed within existing social groups. A participant who performed the Harlem Shake Challenge did so with their college classmates, then uploaded the post to their student body's Facebook page:

> *"We had a Facebook page, the student body. We posted the video there. And I think everyone who participated shared it. Who would see the post? I mean my friends and friends' family."* —P23, Harlem Shake Challenge

Four participants who performed potentially risky challenges did not post their participation to social media. Three wanted to avoid judgment and public scrutiny, while the other did not know how to post the video to a social media platform at the time they performed the challenge (when they were younger). For example, P9 preferred to perform the KiKi challenge in private, simply because they were not confident in their dance abilities and wished to avoid criticism:

> *"They posted it online, and I didn't, because I'm not even a good dancer. It was just, like, I was doing it in the privacy of my own home, own space. And it's just, like, 'oh, I'm going to post it and then millions of people are going to watch it and then critique', this and that. That's just not me."* —P9, KiKi Challenge

This suggests that social media challenges, particularly challenges with higher risk, may be more widespread than what is viewable on social media. Yet, the fact that these participants did not upload a video of themselves performing the risky behaviors may have also hindered the transmission of that challenge within their social networks.

In summary, the *Specificity of Response Matching* for both prosocial and potentially risky participants showed that they often modified the challenge. Of particular interest, potentially risky challenge participants modified the challenge to make it safer. Yet, both prosocial and potentially risky challenge participants tended to match the behavior of their models when sharing their performance to social media. In turn, the observers became models themselves.

As demonstrated above, behavioral contagion theory was a useful framework for understanding why young adults participate in viral social media challenges, though some of our empirical findings departed from theory. For instance, similarities between models and observers did not seem to matter all that much when it came to potentially risky challenges, and prosocial challenges were more often propagated through direct peer influence, rather than the crowd. Therefore, in the next

section, we examine other factors that influenced participants' decisions to perform social media challenges that fell outside the scope of behavioral contagion theory.

5.3 Factors that Motivate Participation in Viral Social Media Challenges in Addition to Behavioral Contagion (RQ2a)

To answer RQ2, we used a thematic approach to identify the factors that influenced interviewees to participate in viral social media challenges beyond what was explained through the lens of behavioral contagion theory. We identified (1) Social Pressure (71%, N = 24), (2) Entertainment Value (41%, N = 14), and (3) Attention-Seeking (32%, N = 11) as three emergent factors that motivated interviews to participate in their respective challenges. In this section, we will describe these themes in more detail.

5.3.1 Social Pressures. The most common motivation we observed in participants for engaging in viral social media challenges was the **Social Pressure** that they received from others. Comparatively, social pressure was more prevalent for prosocial challenges than potentially risky challenges, with all Ice Bucket Challenge participants citing social pressure as a key motivator. Social pressure appeared in two forms: (1) *direct encouragement* from peers and (2) *peer acceptance*. Overt social pressure directly from peers is not a characteristic of behavioral contagion theory; yet this response was frequently reported among participants [47]. Indeed, most prosocial and a few potentially risky challenge participants were directly encouraged by a friend they knew outside of social media to participate. In this way, prosocial challenge participation seemed to be less related to behavioral contagion effects and more so a function of direct social pressure from existing social relationships:

> *"For the mannequin… it was mostly other people in the class, that were in the gym class, that said, like, 'oh, let's all do this'. And then, they encouraged other people to say 'okay'."* —P12, Mannequin and Ice Bucket Challenge

In contrast, the Cinnamon and KiKi Challenges were more likely a result of seeking *peer acceptance,* or desiring to fit in. This contrasted with *direct encouragement*, because no one specifically asked them to participate in the challenge, but they felt like participating in the challenge would help them be part of the in-group:

> *"And I think I did it because everyone I was going to school with did it at the time. And I figured there has to be something about it if everyone was doing it."* —P20, Cinnamon Challenge

Overall, the *Social Pressure* that surrounded viral social media challenges was a key factor in a participant's desire to perform the challenge. Yet, *Social Pressure* occurred in distinctly different ways for prosocial versus potentially risky challenge participants. We saw a stark dichotomy in the use of the words "*friend*" versus "*everyone*" in prosocial challenge versus potentially risky challenges. Potentially risky challenge participants more often referred to an ambiguous crowd, wanting to be part of it (i.e., peer acceptance), while prosocial challenge participants seemed to be already embedded in a peer group that encouraged them toward performance (i.e., direct encouragement). Next, we discuss attention-seeking as a motivation among participants

5.3.2 Attention-Seeking. **Attention-seeking** was another motivation present across the challenges with many prosocial and potentially risky challenge participants citing this factor as a reason for their participation. *Attention-Seeking* came in two forms: (1) *Wanting to Get Noticed* (53%, N = 10) and (2) *Wanting Recognition* for promoting a good cause (47%, N = 9). Prosocial

participants stated that they wanted attention and participating in the challenge was one way to get that attention, especially when they were younger:

> *"I think it was a lot about the attention. I was in high school and I really wanted attention. It was a good way to get it because you're getting water dumped on your head, and it's a little funny."* —P21, Ice Bucket Challenge

For potentially risky challenges, attention was sought for performing the challenge better/longer than their peers, which emphasized the competitive, almost hazing, aspects of the challenges. For example, P10 strived to be the person who could withstand the discomfort of swallowing powdered cinnamon longer than his peers:

> *"It was definitely peers, and like I said, you know, the attention. Seeing other friends posting videos, and who could do the challenge longer."* —P10, Cinnamon Challenge

One participant who performed the KiKi Challenge explicitly wanted to get noticed by their followers. They told their followers beforehand that they would perform the challenge as part of their Snapchat streak.

Overall, *Wanting to Get Noticed* by participating in something that was already viral, whether it was to be entertaining or by pulling off some kind of feat, was a motivating factor for our interviewees. Yet, *Gaining Recognition* for promoting a good cause was type of attention-seeking behavior that was unique to participants of the Ice Bucket Challenge. Having others see them in a positive light was meaningful to our participants, who wanted to be seen as kind, caring, and altruistic by others. Although many genuinely wanted to promote awareness for ALS, some admitted that they gained secondary benefits of being recognized as someone who would support such a noble cause:

> *"[We] were, like, good people that want to help. Very caring, very kind."* —P25, Ice Bucket Challenge

Overall, viral social media challenges served as a way for some participants to garner attention from peers or to improve their social image. The type of attention these participants sought ranged from going viral on social media to being recognized for their contribution to a good cause. In the next section, we discuss the *Entertainment Value* participants perceived from the social media challenges they performed.

5.3.3 Entertainment Value. **Entertainment value** was the third most common motivation given for engaging in viral social media challenges. We found that about half of potentially risky challenge participants and prosocial challenge participants emphasized the *Entertainment Value* their social media challenge offered. *Entertainment Value* appeared in two distinct ways within our interviews—as *amusement* (fun the participant anticipated having by performing the challenge) and *curiosity* (the participant's desire to see what happened due to performing the challenge and/or sharing via social media).

Out of the participants who sought *amusement*, half were participants of prosocial challenges, while the other half participated in potentially risky challenges. For example, most KiKi Challenge participants saw the dancing aspect of the challenge as fun, even though many acknowledged that doing so while outside a moving car seemed dangerous:

> *"It seemed like fun, and I personally liked the artist who sings the song."* —P17, KiKi Challenge

The remaining prosocial and potentially risky challenge participants were *curious* about their challenge. Some wanted to see how people would react to seeing them perform the challenge,

while others wondered what it would feel like to perform the behavior itself and if they would have the same reaction as their model when completing the challenge:

> *"Mostly curiosity. Just because, seeing other people's reactions, I kind of wanted to see if I would have the same reaction."* —P29, Cinnamon Challenge

We did not see any apparent differences between prosocial and potentially risky challenges when it came to *Entertainment Value*. Overall, social influence (i.e., *Social Pressure, Entertainment Value*, and *Attention-Seeking*) played a role in why our participants chose to engage in viral social media challenges. It seemed to play a stronger role in prosocial challenges than potentially risky ones, likely because the more social and fun nature of these challenges. Yet, in some cases, interviewees resorted to seeking attention through negative means (e.g., swallowing cinnamon) as risky behaviors also staved off boredom and garnered the attention participants craved. Importantly, none of the participants interviewed in this study mentioned that a motivation to participate in viral social media challenges was to intentionally inflict harm unto themselves, nor to position themselves in a way that may cause harm to others. Also, none of the participants reported serious physical or emotional harm because of performing their viral social media challenge. We unpack the implication of this finding in more depth in our discussion.

To contrast these social influences with behavioral contagion theory, extrinsic forces are often used to describe how a contagious behavior spreads from model to observer [47]. The motivations that arose from our thematic analysis seemed to change participants' approach-avoidance gradients due to intrinsic motivations or based on participants' internal needs for social acceptance. Thus, we conclude that it may be useful to apply behavioral contagion theory in conjunction with other theories of social influence—such as social reinforcement theory—when studying the phenomenon of viral social media challenges [22]. In the following section, we examine interviewees' post-hoc reflections about their viral social media challenge participation.

5.4 Post-Challenge Assessments of Past Participation (RQ2b)

Our thematic analysis uncovered ways in which our interviewees reflected on their participation in a viral social media challenge, including (1) their feelings of regret, and (2) factors that would have made them think twice about participating in the challenge. We discuss these themes below.

5.4.1 Feelings of Regret. While many participants from both prosocial and potentially risky challenges held no remorse toward their participation, 38% (N = 13) of our interviewees did express some level of regret. Interestingly, the proportion of those expressing regret for prosocial challenges was slightly higher than for potentially risky challenges. One of the most common reasons for why Ice Bucket Challenge participants felt regret was because of their insincere concern about the purpose of the challenge (i.e., advocating for ALS):

> *"I wish I had cared a little more about what it was about. Even though it felt kind of personal because my uncle had ALS, it still, like, was more about the attention than what it was trying to promote. Which happens a lot with social media. I think it starts off as maybe well intentioned and just becomes about us."* —P21, Ice Bucket Challenge

P2 regretted promoting the Ice Bucket challenge after finding out that many of the funds donated did not go directly to finding a cure for ALS. Meanwhile, the participants of other prosocial challenges (i.e., Harlem Shake, Mannequin) did not express any regrets. Further, none of the regrets expressed by prosocial challenge participants were because of the personal risks or outcomes of participation. This was not the case with potentially risky challenge participants, as some interviewees regretted performing the challenge itself. For instance, when describing their regrets,

P20 reflected on the physical pain caused by the challenge as they did not know what to expect prior to participating and were surprised by how much it hurt to ingest a mouthful of cinnamon without any water.

Another potential regret expressed by KiKi Challenge participants pertained to the size of the audience they were able to reach. For instance, P30 wished they had known that their post would not achieve viral success, like others had. P30 attributed the lack of virality to her bad performance, suggesting that not receiving the attention that she expected made her feel that she performed the challenge poorly. This confirms our earlier theme of attention-seeking as a common motivation for participating in viral social media challenges.

> *"You weren't going to go, like, instantly go viral like everyone else did. Some people went, but then again it could have been due to the platform I posted on, or my bad dancing."* —P30, KiKi Challenge

In summary, we sought to uncover the aftermath of contagion and how it is internalized, or reflected upon, by participants. This analysis goes beyond behavioral contagion theory, which focuses only on factors that lead to the execution of the behavior itself. The regrets brought forth by our participants further solidified our conclusion that viral social media challenges, particularly those with potential risks, are not performed with the intention to cause self-harm. Yet, some participants only realized the potential for harm after participating in the challenge. Next, we present participants' reflections on what might have made them reconsider their participation in viral social media challenges.

5.4.2 Possible Preventions. We discovered the characteristics of a viral social media challenge that would have hindered our participants from performing their challenge. The most common response for both prosocial and potentially risky challenge participants was if the behavior encouraged by the challenge presented harm to themselves or others, or *knowing risks* associated with the challenge. Indeed, interviewees of prosocial challenges even sometimes explained how they made risk assessments and chose intentionally not to perform challenges that posed the potential for harm:

> *"I think these two challenges, compared to other ones, like the Tide Pod challenge or the Cinnamon challenge, those like, that's just something one shouldn't do. Where these challenges were just harmless… Like, anything like, there weren't weapons or anything that could do damage."* —P12, Mannequin and Ice Bucket Challenge

In contrast, potentially risky challenge participants, who earlier acknowledged that some risk was involved in the challenge, needed to see an even risk threshold by observing more severe consequences (i.e., death) of the challenge, for their risk avoidance-level to increase. For instance, P14 said that they would not have done the Cinnamon Challenge, if someone died performing it. Yet, only two participants from a potentially risky challenge reported the presence of an advisory warning on any of the social media posts they viewed prior to engaging in the challenge. Only one reported that the warning was an official advisory, where "*viewers' discretion was advised*" (P24, KiKi Challenge).

Another deterrent for participation was potential *damage to their social image*, which applied for both prosocial and potentially risky challenges. One way a challenge might damage one's social image was if the challenge had a negative origin:

> *"Maybe if there was some, like, negative underlying connotations that I didn't know about, or some, like, backlash. Or there was, like, some sort of reason people were doing it that I didn't agree with it."* —P24, KiKi Challenge

This theme aligned directly with our earlier motivation of participating in challenges to gain social recognition for promoting a good cause and/or enhance their social image.

A small percentage of participants directly mentioned that lower density and/or numbers (i.e., environmental determinants of behavioral contagion) of people performing the challenge would have been a reason against participation. However, this low frequency might be because behavioral contagion is considered a subconscious factor in participation that requires a higher level of self-awareness from those it affects. For P19 reflected on their participation, and in doing so, had the realization that the perception that "all" their friends were doing it persuaded them to engage as well.

> *"Honestly, I guess if all my friends didn't do it, I probably wouldn't have done it."*
> —P19, Ice Bucket Challenge

In summary, many of the reason's interviewees would have reconsidered their participation aligned well with the dimensions of behavioral contagion theory. For instance, increased awareness of the risks involved could have been accomplished by observing more negative consequences to the model(s). Similarly, *Perceived Viral Reach* (i.e., density and number) could also have hindered participation. However, damage to one's social image aligned more closely with our emergent themes related to overt social influence. In the next section, we reflect on whether and how behavioral contagion theory was a useful lens for understanding why young adults participate in viral social media challenges.

6 DISCUSSION

We first reflect on whether and how behavioral contagion theory was a useful framework for understanding why young adults participated in viral social media challenges (RQ1). Second, we go beyond contagion theory to understanding how social influence also played an integral role in these challenges (RQ2). Third, we discuss design implications specific to risk mitigation strategies for promoting the safer and more beneficial participation in viral social media challenges. We conclude by stating the limitations of our work and areas for future research.

6.1 Behavioral Contagion Effects of Viral Social Media Challenges

Overall, we found that behavioral contagion theory was useful when examining how and why young adults participated in viral social media challenges. As summarized in Table 3, participants often had initial reservations about performing a challenge, but their internal restraints were reduced when they believed and actually saw other people performing the challenges on social media. Yet, participants of prosocial challenges more often saw similarities between themselves and those modeling the challenge on social media than those who performed riskier challenges. Participants observed both positive and negative consequences to the challenge model, which led to risky challenge participants often modifying the challenge to make it more interesting and/or less risky. Finally, most participants propagated the virality of the challenge by sharing it via social media to others. The virality of these challenges played a central role in the spread of both prosocial and potentially risky behaviors among young adult social media users. To this end, we found that applying foundational theories from psychology to this new social computing phenomenon was applicable and, for the most part, ecologically valid.

Yet, behavioral contagion theory alone did not (and could not) explain all the observed patterns in our empirical data. This makes sense as behavioral contagion theory was first formulated based on observing behaviors propagated through physical crowds [47]. Therefore, this theory could not have anticipated the network effects of video-recorded behaviors that persist indefinitely and were not only observed in public, but were searchable and repeatedly viewable, via social media. In short, the originators of the theory could also not have imagined the combined indirect (i.e.,

observing the behavior or strangers) and direct (i.e., observing the behavior of peers and being directly encouraged to do the same) social influences afforded by social media. As such, we relate our research implications to Hekler et al.'s [13] work, which critiqued the theoretical gap related to interpreting, using, and developing behavioral theory in HCI research. They conclude that while HCI researchers are not often engaged in theory development, we are in a unique position to mitigate the shortcomings of behavioral theory when it comes to technology-mediated behaviors. One way that we might start doing this is to identify when existing behavioral theories align well and where they fall short of explaining novel social computing phenomenon.

We contribute to this endeavor in the context of behavioral contagion theory as it relates to the propagation of viral social media challenges among young adults. We did this by taking a hybrid approach that integrates the top-down application of theory with more grounded approaches (e.g., thematic analyses) to uncover additional nuance in the data. By taking this approach, a key finding that emerged through our analysis was that overt social influences and direct encouragement within existing social relationships (e.g., friends) played a stronger role in the participation of prosocial challenges than potentially risky challenges. Therefore, the distinction between prosocial versus potentially risky social media challenges is a notable contribution of this research. For instance, future research might consider using a different theoretical lens when studying prosocial challenges. For example, one widely applied theoretical model for understanding the relations among social norms and behaviors is the theory of planned behavior [2]. According to this theory, subjective norms, or perceptions of peer pressure to perform a behavior, are linked to behavioral intentions. Along with personal attitudes and perceived behavioral control, social norms that illustrate potential rewards and punishments for engaging in a behavior are associated with a person's likelihood of engaging in a behavior. For potentially risky challenges, our research questions the prevailing assumptions that homophily and overt peer pressure are strong contributing factors for contagion effects for risky social media behavior. Instead, other frameworks of risky behavior may be applicable for understanding the propensity to engage in such challenges. For instance, social resistance theory [14] has been used to explain high-risk behaviors of non-dominant minority groups in actively engaging in unhealthy behaviors, due to alienation and other factors that create inequalities. Thus, future work may examine whether young adults from non-dominant minority groups are more likely to engage in risky social media challenges compared to the young adults who belong to the dominant majority.

While we focus specifically on the contagious nature of the imitative behavior exhibited through the performance of social media challenges, applying alternative social computing theories, such as Watts' theory of diffusion through online networks [46] to understand how collective behavior propagates through social media as a means of support and solidarity [42], or Goffman's theory of the presentation of self [16] could also be useful frameworks to understand how and why young adults engage in viral social media challenges. Further, it is possible that researchers may need to develop new theories for emerging social media phenomenon, like viral social media challenges, that have a strong psychological component (i.e., behavior) that is amplified by the unique affordances of social media (e.g., explicit network connections, the ease in which sharing occurs, persistence, and searchability). It may be within the interplay between the social and the technical that the uniqueness and nuance of the phenomena can be best explained.

6.2 The Benefits and Risks Associated with Viral Social Media Challenges

None of our interviewees set out to hurt themselves or experienced grave consequences because of their participation. In contrast, many of our participants reaped benefits from engaging in a social media challenge, ranging from peer acceptance, garnering attention, being entertained, or satisfying their curiosity (As shown in Appendix Table A.3). Importantly, many interviewees altered

how they performed various challenges to increase entertainment value and/or make the challenge less risky. While prior research on suicide contagion and viral social media challenges, specifically the Blue Whale Challenge [25, 37], emphasize digital self-harm resulting from viral social media challenges as a societal problem, our research casts light on some of the positive social aspects of viral social media challenges and ways in which to mitigate the potential risks associated with them. Thus, our results highlight the importance of challenging the potential misconception that risky social media challenges are calculated acts of digital self-harm. Through our results, we also demonstrate that there may be an overemphasis in public discourse on the dangers (and stupidity) of youth engaging in viral social media challenges. For instance, in 2018, the Washington Post Health News [53] headlined the dangers of the Tide Pod Challenge (e.g., teens daring one another to eat Tide Pod detergent). Yet, the American Association of Poison Control Centers only reported 86 instances of teens partaking in this challenge [50], suggesting a "moral panic" around social media challenges that is largely unfounded. Further, blaming youth and calling them stupid for participating in viral social media challenges may be counterproductive, even if the criticism is directed toward harmful online behaviors [9].

We offer a more nuanced framing, where there are both benefits and risks associated with engaging in viral social media challenges. Furthermore, participants in both prosocial and potentially risky challenges experienced some level of regret, ranging from guilt from performatively engaging in the Ice Bucket Challenge without donating to disappointment from not going viral. Thus, the way forward is to emphasize ways in which young adults can benefit from social media challenges in positive and meaningful ways (e.g., increasing the transparency and accountability of donating, tips on how to "go viral"). We also advocate for resilience-based approaches that raise risk awareness [41], rather than abstinence-based approach of risk prevention that discourage social media engagement. Our work acknowledges that young adults see viral social media challenges as a source of entertainment, a means for garnering positive social attention, and/or a way to feel like they are part of a larger community. Without accepting these motivations toward participation, we will not be able to design effective interventions that prevent unintentional harm to youth and young adults due to their participation in viral social media challenges. Next, we present our implications for design with an eye toward risk mitigation.

6.3 Implications for Design and Risk Mitigation

Based on our results, we propose several solutions for reducing the negative behavioral contagion effects of social media challenges. These solutions focus on adopting a multifaceted approach, rather than a single strategy to minimize unhealthy behaviors. First, we should consider how we might raise risk awareness in a way that impacts the approach-avoidance gradient of young adults toward abstaining from or altering riskier social media challenges, to reduce the potential for harm. This may include advisory warnings about the potential risks prepended to videos promoting various challenges, the dissemination of news articles about potential known risks, viral social media campaigns about prevention. Importantly, such risk awareness and prevention campaigns should draw from evidence-based research on effective risk and health communications (e.g., References [27, 54]), especially those focused on the use of interactive media. For instance, Li and Sundar found that strong bandwagon cues (e.g., if others agree with this message, I should too) and features that give social media users the agency to engage with the message (e.g., post a comment) reduce negative reactance that leads to message rejection. Therefore, carefully managing fear-based prevention messaging to promote positive and healthy engagement in social media challenges is an important area where more research is needed.

Second, another approach would be to develop algorithmic approaches for identifying the more harmful, viral challenges (i.e., Blue Whale, Cinnamon Challenge) and prevent them from spreading

across the internet. For instance, YouTube banned risky pranks and challenges from its platform [55]. Similarly, TikTok recently banned the viral Devious Licks Challenge [51], which has led to the arrest of high school students who were encouraged to steal or vandalize school property as part of the challenge. By reducing the density and volume of observable social media challenges that promote risky behavior, we might alter the perception that "everyone is doing it," which may reduce one's hesitation to perform the challenge. Yet, it is important to not take this prevention approach to the extreme of trying to eradicate all potentially risky challenges from the internet. Some level of calculated risk is appropriate and necessary for both adolescents and emerging adults [4, 6]. Further, Chancellor et al. [44] found that censoring self-harm content (i.e., pro-eating disorder posts) had mixed results as participants used word variations to circumvent content moderation. Therefore, further research needs to be done to understand the effectiveness of this approach as it pertains to viral social media challenges. Rather than censoring such content, social media platforms could possibly adjust their algorithms so that content promoting negative behaviors, including risky social media challenges, is not propagated virally through networks.

A novel and strength-based approach to risk mitigation would be to create design-based heuristic guidelines for promoting more positive viral social media challenges. By creating design guidelines for social media challenges that are evidence-based and promote propagation of positive behaviors, rather than simply warning users of their potential risks, we provide a uniquely innovative and provocative way to empower young social media users in creating well-designed and powerful user-generated content. For example, we saw an interesting pattern emerge in our data where participants modified challenges to make them safer. Thus, a useful design guideline could be to involve a small level of risk but make the challenge flexible enough in its performance that participants are empowered to perform the challenge, reap the social rewards, and make informed decisions about the level of risk in which they are comfortable engaging. Given that participants seemed to be drawn to the idea of going viral, more so than the inherent risk of the act itself, new challenges that are fun and have enough risk to not be boring may be able to fulfill this need. Finally, yet more difficult to tackle, is the larger need for research on designing social media platforms to support the well-being and social needs of youth in ways that promote positive peer influence, mitigate the need to garner attention from the crowd, and entertain youth in meaningful and life-fulfilling ways. Given the recent Facebook controversy over the platform's negative influence on the wellbeing of youth [56], we make the urgent call for HCI and social computing researchers to prioritize an agenda that works toward making social media healthier for youth.

6.4 Limitations and Future Work

Our study offers the unique contribution of first-hand insights into the factors that contribute to young adults participating in viral social media challenges through an application of behavioral contagion theory. However, our study has some limitations. The first limitation is our sample, as we recruited from a specific demographic of university students (18–27 years old) in the Southeastern United States, which limits the generalizability of our findings to college students in similar regions. Future researchers should consider studying a more diverse range of participants by using a "hashtag" search for people performing specific challenges of interest. A second limitation is that the semi-structured interview design required participants to reflect on their performance of social media challenges after-the-fact. Therefore, it is possible that interviewees could have misrepresented their stated motivations when reflecting on their experiences prior to participating in a challenge. Diary studies might present a potential way to overcome this challenge in future research.

Additionally, we did not restrict study participation based on which challenges were performed. As a result of social desirability bias, many of the participants who self-selected to participate in our

study likely participated in prosocial or safer challenges, as opposed to some of the more dangerous or publicly scrutinized challenges (e.g., Blue Whale Challenge or Tide Pod). Future researchers can possibly reach greater diversity among challenge participants, particularly participants who performed more dangerous challenges, by using a research method that offers greater anonymity to participants, such as administration of an anonymous online survey. At one point, we had to screen out Ice Bucket Challenge participants as they started to overwhelm our sample. The uneven distribution of challenges performed may have been correlated to the general prevalence of these challenges. Therefore, future work should focus on a wider variety of challenges, including the more dangerous challenges and new challenges that have emerged since conducting our study. Finally, future work could examine the factors that contribute to viral social media challenge participation quantitatively to validate and increase the generalizability of our qualitative findings.

Finally, we applied the theoretical lens of behavioral contagion theory as an a priori framework in which to interpret our interview data (RQ1). While this approach was motivated by prior work, well-suited for the problem, and novel, it narrowed the scope of our findings to this particular theory. Therefore, we supplemented our deductive analysis by also conducting a thematic analysis to understand emergent patterns in our data. By doing this, we identified several other relevant theoretical frameworks that may also be well-suited for understanding young adults' motivations for participating in viral social media challenges. Therefore, we encourage future researchers to leverage alternative theoretical frameworks and build new sociotechnical theories to understand the continuing virality of new social media challenges as they emerge.

7 CONCLUSION

We provide empirical evidence that behavioral contagion theory is useful but not wholly sufficient for explaining why young adults engage in viral social media challenges. By showing how social influence plays a key role in the propagation of unconventional online behaviors, we build a case for enhancing the user experience when designing these challenges. By mitigating risks and optimizing the social benefits garnered from viral social media challenges, we can help young adults engage with one another through social media in more meaningful ways.

APPENDIX

Table A.1. Structure of Interview with Sample Questions

Structure	Sample Questions
Background Information	• Which social media challenge did you participate in? • How did you first find out about the challenge? • On which type of media did you discover the challenge?
RQ1: Understanding Participation in Viral Social Media Challenges through the Lens of Behavioral Contagion Theory	**Approach-Avoidance Gradient, Reduction of Internal Restraints:** • Approximately how many posts of the challenge did you view before you decided to participate? • How many people do you think were participating in the challenge at the same time as you? • Were there any advisory warnings or resources listed with the social-media posts associated with the challenge? **Characteristics of the Model and Observer:** • What information did you have about the first person you saw perform the challenge? What was their relationship to you? • What similarities did you see between yourself and the first person you saw perform the challenge? **Observed Consequences to the Model:** • Were any of the images or videos you saw of the challenge graphic? Did any of them involve weapons, harm to the person performing the challenge, or harm to others? • Did any of the information that you saw about this challenge seem to make participation appear "cool," "glamorous," courageous, or special? **Specificity of Response Matching:** • How closely did you duplicate what you saw in videos, images, or posts? • What did you post about your participation in the challenge?
RQ2a: Motivations beyond Behavioral Contagion Theory	• What first caught your attention about the challenge? • What were your personal motivations for participating in the challenge?
RQ2b: Participants' Post-Hoc Reflections	• What do you wish you had known about the challenge before you participated? • What advice do you have for others who want to participate in the challenge? • What might have prevented you from participating in the challenge?

Table A.2. Structured Codebook Aligned to Behavioral Contagion Theory

Theoretical Dimensions	Themes (Codes)	Illustrative Example
Approach-Avoidance Gradient with Reduction in Internal Restraints	**Perception of Challenge** (Positive, Negative, or Neutral)	"'Basic' wasn't a term being used back then, but that's something that could describe it now… like, 'mainstream,' 'dumb', 'stupid' for people who are older, 'cause a lot of the younger generation were doing it." —*P22, Cinnamon Challenge*
	Environmental Determinants Viral Reach (Density, Number)	"Oh, a lot. I was looking at all the different types, because so many people had different styles and stuff." —*P6, KiKi Challenge*
Characteristics of the Model and Observer	**Relationship to Model** (Friend, Acquaintance, or No Relationship)	"The first time I saw it, it was definitely someone I didn't know." —*P14, Cinnamon Challenge*
	Perceived Similarities (Age, Gender, Race/Ethnicity, School, Performance of Challenge, Motive)	"I guess similarities would be we're the same age, we go to the same school." —*P3, Ice Bucket Challenge*
Observed Consequences to the Model	**Observed Consequences** (Physical, Social, None)	"…I remember seeing one where they went a little overboard, like they put way too much ice so they ended up falling in the tub and I saw blood." —*P5, Ice Bucket Challenge*
Specificity of Response Matching	**Modification of Challenge** (Group Performance, Reduced Risk)	"Woah, no, no, no, no. I did not do it outside of a car… I did it like, by the water, outside. I didn't do it like, outside of a car." —*P6, KiKi Challenge*
	Sharing Behavior (Posted on Social Media, Participated Offline)	"I never posted anything about me doing it, but I retweeted other people doing it. —*P20, Cinnamon Challenge*

Table A.3. Codebook Generated from Thematic Analysis

Themes	Codes (Subcodes)	Illustrative Example
Motivations for Participation	**Social Pressure** (Direct Encouragement, Peer Acceptance)	"I was tagged by a friend. I thought the challenge was to honor, I guess." —*P15, Ice Bucket Challenge*
	Attention-Seeking (Get Noticed, Get Recognition)	"I posted it for that reason, for others to see it, so I believe it made me happy." —*P13, Ice Bucket, KiKi, and Cinnamon Challenges*
	Entertainment Value (Amusement, Curiosity)	"I would say because I was just a little kid at the time, and kind of, a little teenager, I would say that my motivation was for entertainment purposes." —*P2, Ice Bucket Challenge*
Participant Reflections	**Post-Challenge Assessment** (No Regrets, Regrets)	"That it probably was super dumb to, like, try and, like, eat a spoonful of cinnamon. But things, like afterwards, there was an article or something talking about how people were inhaling cinnamon. Then, I thought it probably wasn't too smart." —*P29, Cinnamon Challenge*
	Possible Preventions (Knowing Risks, Damage to Social Image, Density/Number)	"Knowing that it was associated with something like, really negative or dangerous. Or, like, people were dying because of it." —*P8, KiKi Challenge*

Table A.4. Participants Profiles

ID	Gender	Age	Challenge	Media Platform
1	Female	27	Ice Bucket	Facebook
2	Male	22	Ice Bucket	Facebook
3	Female	20	Ice Bucket	Facebook
4	Female	20	Ice Bucket	Facebook
5	Female	21	Ice Bucket	Facebook
6	Female	20	KiKi	Facebook, Instagram, Snapchat
7	Female	21	KiKi	Twitter, Instagram
8	Female	20	KiKi	Instagram
9	Female	18	KiKi	Instagram
10	Male	23	Cinnamon	Facebook
11	Male	18	Ice Bucket, Cinnamon	Facebook, YouTube
12	Female	18	Ice Bucket, Mannequin	Facebook, Instagram
13	Female	20	Ice Bucket, Cinnamon, KiKi	Instagram
14	Male	19	Cinnamon	YouTube
15	Male	22	Ice Bucket	Facebook
16	Female	19	Cinnamon	Instagram, Twitter
17	Female	20	KiKi	Instagram
18	Male	21	Ice Bucket	Facebook, Instagram
19	Female	21	Ice Bucket	Facebook
20	Female	20	Cinnamon	Twitter
21	Female	20	Ice Bucket	Facebook
22	Female	20	Cinnamon	In-Person Only
23	Male	24	Harlem Shake	YouTube
24	Female	20	KiKi	Instagram
25	Female	19	Ice Bucket	Instagram
26	Female	19	Ice Bucket	Facebook
27	Female	19	Ice Bucket	Facebook
28	Female	19	Ice Bucket	Instagram
29	Female	20	Cinnamon	Facebook
30	Female	21	KiKi	Twitter

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