

A Social Media Campaign for Promoting Active Travel to a University Campus

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Abstract

Context: Promoting regular physical activity can be challenging. Active travel (AT), walking and biking for transportation, is a way to achieve more activity, but rates remain low in the United States. With increased technology use, social media is one way to expand reach.

Objective: The purpose of this study was to describe the reach of social media in a campaign to promote AT to a university campus.

Design: This was an observational study.

Setting: The Active Lions campaign promoted AT to and on a large university campus for employees and students. The campaign included local events promoting AT, a smartphone app, and social media postings (Facebook, Twitter) from August 2014 to August 2015.

Main outcome measures: The social media postings included different types of messages about AT. These posts were then examined and categorized, and any responses or interactions were recorded to identify trends for engagement.

Results: The Facebook page had 177 followers, educational posts elicited the most responses, posts with pictures averaged 6 clicks and 1 like, and posts with links averaged 3 clicks and 1 like. Active Lions had 103 Twitter followers; educational posts on Twitter had the most activity, with 149 interactions.

Conclusion: Facebook and Twitter appear to reach some of their followers in motivating and promoting regular physical activity. It is important, however, to recognize that posting on social media targets the younger population. Therefore, to reach more adults, it may be more beneficial to find other tactics to promote regular physical activity.

Keywords: Active travel; Physical activity; Social media; College campus

Abbreviation: AT: Active Travel

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Introduction

As the fourth leading risk factor for global mortality, physical inactivity has become a widespread issue that must be addressed [1]. Physical inactivity is estimated to account for a significant portion of the major non-communicable diseases of coronary heart disease, type 2 diabetes, and breast and colon cancers worldwide, many resulting in premature mortality [2]. To combat such health issues and their prevalence, individuals are recommended to participate in a minimum of 150 minutes of moderate-intensity aerobic physical activity or 75 minutes of

vigorous-intensity aerobic physical activity a week [3]. One way to incorporate more physical activity into daily life is to engage in active travel (AT) to and from destinations. AT is a form of aerobic exercise that often includes the modes of transportation of walking and biking. Rates of AT participation are much higher in Western European countries and Australia compared with the United States [4, 5]. Based on compiled surveillance, the Centers for Disease Control and Prevention (CDC) noted that AT was only the primary mode of transportation in a work week (Monday-Friday) for 2.6 to 3.4% of individuals [6].

Significant evidence has examined the influences on AT participation; from demographics (age, sex, race, education level) to the built environment [6-12]. Other research has examined psychosocial influences on AT, including attitudes or beliefs, motivation and social support [13-16]. These psychosocial factors are particularly important as they are modifiable and easily targeted with intervention strategies. Knowledge of the benefits of AT participation, self-regulation skills (e.g. planning and scheduling), self-efficacy, and self-confidence are all constructs that can be targeted through behavior change approaches and are grounded in theory. Despite a growing body of literature addressing the influences on AT participation, there is limited intervention work that has attempted to increase this behavior.

Due to the increase use of technology worldwide, more health behavior change campaigns are using social media as a way to reach their targeted audience [17]. Smartphones, laptops, and tablets have become commonplace in everyday life in leisure and at work and have high rates of usage. Along with these gadgets emerging, social media has become the new outlet for communicating with others. Since 2005, the percentage of adults in the United States using social media has increased from 8% to 72%. Young adults (age 18-30) are reported to spend 67% of their time on mobile devices accessing social media sites. The most popular form of social media today is Facebook accounting for 84% of users, which exceeds one billion people worldwide. The second most popular outlet is Twitter at 53% of social media use, with more than 100 million active users each day [18-22]. These social media platforms offer many outlets for communication with and individual's social network or organizations as well as updates on relevant topics or interests.

Internet and social media based physical activity interventions have become increasingly popular. Vandelanotte and colleagues [23] conducted a systematic review of website-based physical activity interventions. This review found modest evidence supporting website-based physical activity interventions, with more than half of the studies reporting positive health behavior changes. Vaterlaus et al. [22] studied the effects of social media use on health behaviors with mixed results. Social media was motivating by allowing participants to track one's progress through apps such as "Nike+™" and "Map My Run™," as well as "#transformationtuesday" posts (i.e., pictures before and after intervention). Among young adults, a reported motivator was that new followers will want to see a person's best looking posts. However, participants claimed that looking at media was distracting to them from engaging in physical activity [22].

Active lions campaign

The Active Lions campaign's primary aim was to increase AT to and on a university campus for all students and faculty / staff (employees). The campaign was established through supporting partnerships: employee health / wellness, student health/wellness, transportation services, and the local bicycle coalition and was supported through internal funding from the campus sustainability initiative. In addition to increasing AT participation, the campaign also aimed to impact attitudes and beliefs towards AT. The campaign used behavior change strategies founded in the Social Cognitive Theory [24] and the Transtheoretical Model [25].

The primary behavioral constructs targeted included self-efficacy, self-regulation, outcome expectations, and the processes of change. The specific approaches used in the Active Lions campaign were based on research from previous studies. Data from a longitudinal cohort of Penn State University undergraduate students had noted students become more inactive during their time in college and that living off campus is also associated with a decline in physical activity [26]. Additionally, research on AT among Penn State students found weight and health outcomes to be associated with more AT [27]. This study also noted a number of social and physical environmental variables related to AT participation, including a lack of knowledge of local resources supporting AT (e.g. bike lanes, best routes). Previous studies with university faculty and staff indicated that behavioral beliefs regarding AT, social support for AT, and time constraints were significantly related to AT [8]. These factors were the primary targets for the Active Lions campaign. To increase participation and promote messages about AT, a social marketing campaign was created through a smartphone app. The components of this campaign are described in more detail elsewhere [28, 29].

Given the multiples approaches used in the campaign, it was important to examine how the social media approaches were worthwhile a tool in a larger, multi-strategy intervention. Therefore the purpose of the following study was two-fold: (1) to determine the effectiveness and reach of a social media campaign promote AT to students and employees on a large university campus and (2) to determine the types of postings that had the greatest reach.

Methods

Setting and population

The Active Lions campaign was based at a large university in the northeastern United States situated in a small urban area. The campus sits on more than 8,500 acres, is enclosed / self-contained from the community with limited traffic running through the core of campus. Bike lanes and paths lead to campus from multiple directions within the community. This campus has more than 46,000 undergraduate and graduate students enrolled, 70%+ of whom live in off-campus residences. The student population is approximately 70% Caucasian, 46% female, and 62% come from the state of Pennsylvania. The university also employs more than 26,000 full and part-time faculty and staff [30]. Employees are primarily (79%) Caucasian and 51% are female. The university and community are both certified bronze level bike friendly from the League of American Bicyclists through their Bike Friendly America Program which evaluates communities and universities on bike-friendly criteria for engineering, education, encouragement, evaluation and enforcement at different levels (bronze, silver, gold, platinum) [31, 32].

Social media campaign: The social media component of the Active Lions campaign worked to complement the social marketing component and smartphone app. Facebook and Twitter pages were created to target AT beliefs and attitudes and provide motivational messages to encourage the adoption and maintenance of AT participation. Each day of the week featured a different type of post as described in **Table 1**. The main

themes were chosen based on the formative research described above and aimed to target some of the main influences on AT on campus. We also used the social media profiles to advertise different events at which Active Lions was appearing on campus and tips for using the smartphone app. Posts were typically made between 8 am and 11 am local time. As seen in **Table 1**, there were different themes for each day: Monday Mania, Testimonial Tuesday, Where Are We Wednesday, Tip Day Thursday, and Fun Fact Friday.

Ethics: The Institutional Review Board at Pennsylvania State University deemed this research to not involve human subjects since postings were on a public website.

Analyses: The analyses addressed both reach and engagement and included: (1) overall reach and number of followers on both platforms, (2) Facebook-specific data about the types of posts and amount of engagement with each post, (3) Twitter-specific data about posts and engagement and (4) categorization of the content of the posts and the amount of engagement by type.

Overall reach and followers: To determine how many people the Facebook and Twitter pages were reaching, observations were made for one year, from August 13, 2014 to August 31, 2015, the period during which all components of the Active Lions campaign were running.

Facebook insight™ reach data: Data was available separately for posts if they contained: (1) a picture, (2) a link, or (3) a status update. Posts were analyzed for both lifetime post total reach and number of post total impressions. Lifetime post total reach is the total number of people to who received / saw a page post. Post total impressions refer to the number of times the post is displayed whether the post is clicked or not. Followers may see multiple impressions of the same post (e.g., if a follower sees it in their news feed and then they see it a second time if a friend shares it). Consequently, reach may be less than impressions since one person can see multiple impressions. The total numbers of lifetime post total reach and lifetime post total impressions were separately summed for pictures, links and status updates. A percent and average per post were calculated for each type of post. The average number of clicks per type of post was also

calculated. We were also able to determine basic demographics of our Facebook followers (i.e., age group, gender, geographic region).

Tweet activity analytics™ reach data: We were able to document the number of impressions (number of people who saw the tweet), engagement rate (number of engagements per impression), and the number of link clicks for the four 90 day quarters of the study. The top tweet for each quarter was documented and categorized as a picture, link or status update.

Engagement by category of posting: For each daily post on the social media pages, the type of post was assigned one of four categories: (1) educational, (2) fun fact, (3) interactive, or (4) promotional. Educational posts often included information on the benefits of engaging in physical activity. Fun fact posts were categorized as so if the post first read “Fun fact”. Interactive posts were those that contained a question, eliciting a response from followers. Promotional posts contained an encouraging message to followers to engage in AT or provided information about local events relevant to AT. Upon categorization, activity of the daily post was recorded: on Facebook, the number of likes, comments, and shares was recorded. Likewise on Twitter, the number of replies, retweets, and favorites was recorded. The number of engagements (likes, comments, replies, or retweets) was summed for each type of posting for Facebook and Twitter separately.

Results

Overall reach and followers

During the study period, the Facebook page had 176 followers, and the Twitter page had 108 followers. The accumulation of Facebook and Twitter followers over the course of the study period is shown in **Figures 1 and 2**. Over the study period the Facebook page had 465 page posts and there were 360 tweets on Twitter.

Facebook reach

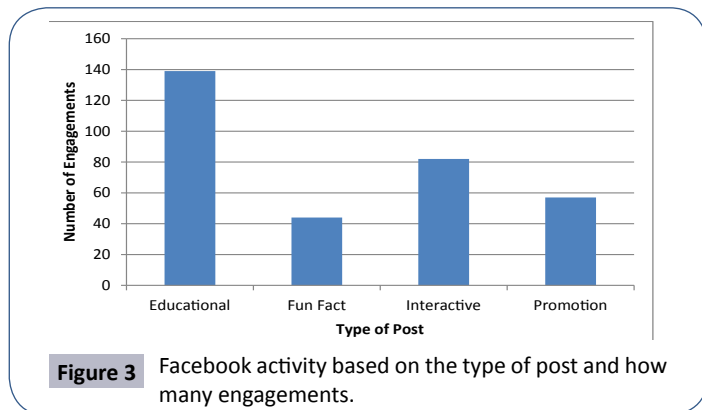
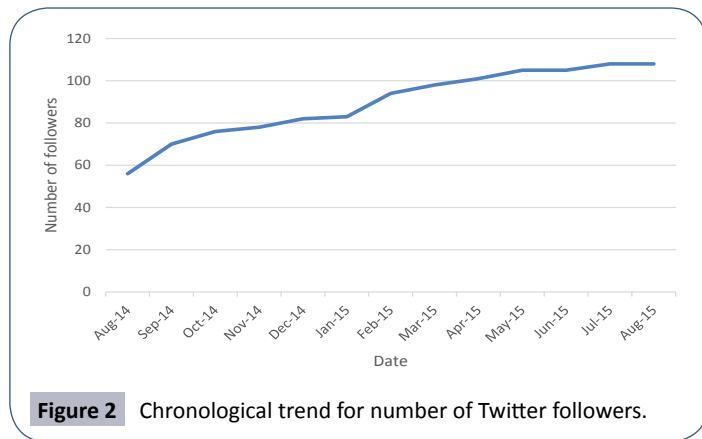
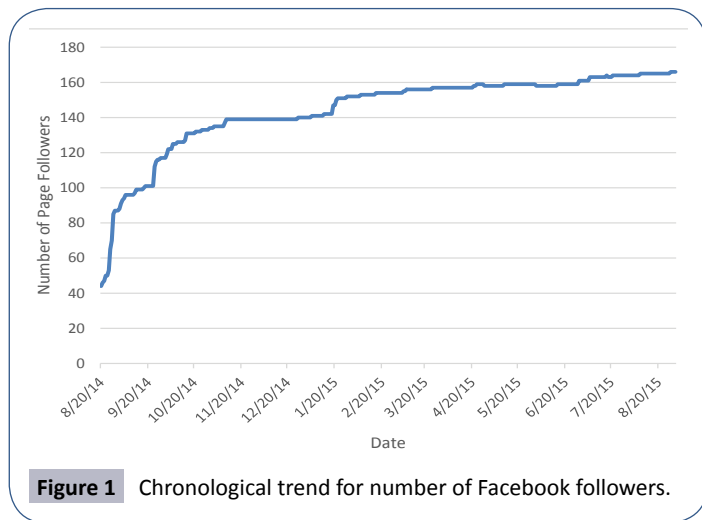
The type of Facebook posts and reach are found in **Table 2**. Posts with links had the greatest total reach and total impressions, though posts with photos had greater average clicks / post. It was

Table 1 Social media components of the active lions campaign.

Day	Type of Message	Example of Post	Constructs and Themes Targeted
Monday Mania	Encouraging or motivating facts about active travel.	Monday Mania: How many minutes per week of moderate physical activity are recommended?	Knowledge and beliefs for active travel, consciousness raising
Testimonial Tuesday	A student or employee would answer 5 questions about why they actively travel.	Testimonial Tuesday – (student/employee name) with link to a blog with the posting	Dramatic relief, peer support for active travel
Where Are We Wednesday	A picture was posted of a place on campus that supported walking or biking. Individuals competed to guess the spot and win a prize.	Tell us where this cool bike rack is for Where Are We Wednesday! <photo>	Environmental reevaluation, increase awareness of supports for walking and biking
Tip Day Thursday	Tips or technical information on walking and biking	Tip Day Thursday: PSU has started a bikeshare program – check it out: <link>	Skill building, increased behavioral capacity
Fun Fact Friday	Interesting events or stories about walking or biking.	Fun Fact Friday! Regular active travel helps avoid anxiety and depression! #activelions #walk #bike #activetravel	Rewarding information, improved knowledge

Table 2 Type of Facebook posts and reach.

Type of posting	Number of Lifetime Post Total Reach (n = 24,253)	% of Posts total reach	Average post total reach per post	Number of Lifetime Post Total Impression (n = 56,656)	% of Posts Total Impression	Average post total impression per post	Average number of clicks / post
Links	13,394	55	55	36,261	64	144	3
Photos	8,440	35	56	15,572	27	102	6
Status	2,419	10	43	4,823	8	86	2



determined that 57% of our followers were women, 25% were in the 18-24 year old age range and 12% in the 35-44 year old group.

We also determined that 88% of our followers were local (within a 30 mile radius of campus).

Twitter reach

Most of the reach occurred during the first two quarters as can be seen in **Table 3**. The engagement rate for the third quarter was slightly higher than the first at 1.2, compared to 1.0. The number of impressions peaked during the first of the four quarters, accounting for 164,372 impressions. The greatest number of link clicks occurred during the first quarter of the year as well. Within each quarter the top tweet was a picture.

Engagement by category of posting

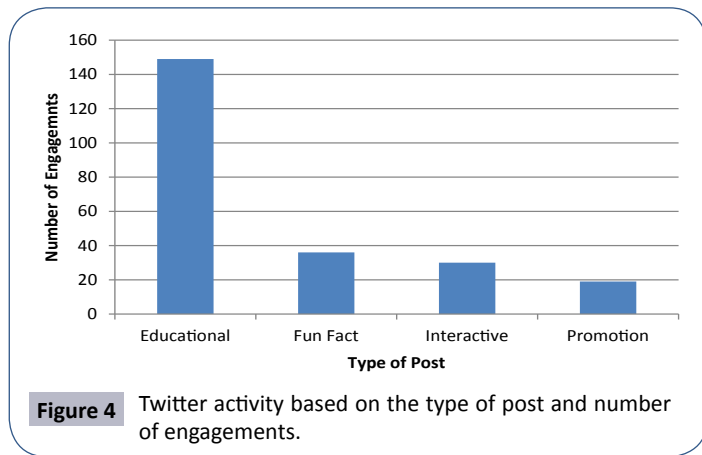
Upon examining the trends for Facebook, it was apparent that educational posts had the most activity, accumulating 139 likes and shares overall. Results for the Facebook postings are found in **Figure 3**. Interactive posts on Facebook had the second highest recorded activity, with 82 total engagements. Promotional posts had the third highest recorded activity, with 82 engagements. Activity recorded did not change over the course of the year, showing consistent engagement over the year. The data for Twitter showed similar results to that of the Facebook page and is found in **Figure 4**. Just as with Facebook, educational posts on Twitter had the most activity, with 149 engagements throughout the year. Fun fact posts had the second highest activity, accumulating 36 engagements overall. The category with the third highest amount of activity was the interactive post, with 30 total engagements.

Discussion

Based on the data collected, Facebook had significantly more activity (more than 50%) and was able to reach more individuals than the Active Lions Twitter page. However, the educational posts on both Facebook and Twitter were the most popular. With the most activity in response to educational posts, more individuals are being motivated to engage in AT by learning of the benefits of regular AT and exercise. Such posts that were shared or retweeted could have reached others not following the Active Lions pages, and motivated them to stay active as well. By seeing others promoting the message of staying active, one may feel more inclined to engage in these healthy behaviors. As in a study by Cavallo et al. [33], a Facebook-based physical activity intervention resulted in an increase in social support and physical activity over time. Therefore, social media “friends” enable one to feel more support through their journeys to stay fit and healthy. Given the evidence that indicates that social support for AT to the workplace from a spouse or coworker outlined by

Table 3 Quarterly engagement for twitter.

Quarter	Number of Impressions	Engagement Rate	Number of Link clicks
August -November 2014	164,372	1	90
December 2014 -February 2015	7852	0.7	27
March - May 2015	7709	1.2	17
June - August 2015	5226	0.3	5



Campbell et al. [15], there are significant implications of this. Future interventions targeting AT could foster social networks surrounding AT participation for technical advice, assistance with route planning or motivation. On a college campus where there is a common final destination, this would be an ideal outreach strategy for social media.

Also popular on both forms of social media were the interactive posts. These posts were most engaging with followers, as they usually asked a question requiring a written response. These posts also served to educate individuals about resources on campus for AT (e.g. locations of bike racks or bike lanes, crosswalk safety features) along with the chance to win a prize for identifying the feature. Our analyses indicated that our photo posts in Facebook had the highest average click per post, showing a strong potential for reach and further engagement. Nearly all of the photo posts on Facebook were of campus-centric content, indicating that individuals were most likely to be engaged with local content than non-tailored posts. Future intervention approaches may continue to use this approach, increasing the prizes offered or other incentives for interacting with the post.

This study was strong in that it used two of the most popular social media platforms used by millions of people worldwide. Despite this strength, the reach of our campaign was limited to employees and students at this campus, limiting our generalizability. The nature of the study also did not allow us to link our findings with any health behavior, attitude, or belief changes. This study was also limited with the age groups we targeted with our campaign; social media use is higher among the younger generations, reaching more individuals at younger ages (mostly students) and possibly lacking reach among older individuals, mostly employees. Additional research is needed to understand the best strategies for reaching older individuals with social media campaigns. Although discussed in more detail elsewhere [34], the

current study was also limited in its ability to examine the effect of the social media campaign on AT participation or attitudes and beliefs about AT among campus community members.

From a comprehensive perspective we were only able to engage a very small portion of the overall campus community. Despite our best efforts to gain a wider reach we struggled with gaining momentum. Our campus partners and supporters (transportation, health and wellness, sustainability) also struggled with gaining followers on social media on this campus and were not able to help us extend our reach considerably. Extending the campaign or investing in paid advertisements on social media could have potentially helped us to extend our reach. While in the current study we were able to examine the types of posts that elicited engagement among the followers we had, further investigation is needed to determine the best strategies for increasing followers. Another notable trend was how interest and engagement were greater for Facebook earlier in the year which declined through the winter months. This could possibly have been related to the poor weather conditions for AT through the winter of 2014-15, with bitterly cold temperatures and heavy snowfall in the region which decreased motivation or interest for AT. Despite the decline in engagement for Facebook, Twitter saw a gradual increase across the academic year, potentially related to more individuals sharing / retweeting and gaining more followers, in a more viral growth pattern than Facebook.

Further research beyond the current study could include followers reporting on their physical activity and AT levels and how they have changed since following the Active Lions social media pages. Additionally, other forms of social media could be used, such as Instagram and Tumbler to see if these forms reach more people. To engage more followers in the interactive posts, "Where Are We Wednesday?" posts could expand their content or offer multiple prizes to foster greater engagement. Hybrid educational and interactive postings could be used to illicit greater engagement, or greater use of photographs with other types of postings.

Conclusion

Social media is an up-and-coming way to reach the masses of people to spread awareness and send health-related messages to people. With physical inactivity on the rise, Facebook and Twitter have become popular outlets to promote physical activity and other health behaviors. In the current study, educational posts explaining the benefits of AT participation seem to be the best at eliciting engagements, showing some potential for future studies. Our study had limited reach in our target audience and highlights the need for further investigation for increasing exposure for health promotion campaigns via social media. This study also noted some of the challenges of growing a social media campaign that attempted to reach a large audience and we conclude it may be more beneficial to use social media approaches as a part of an overall intervention rather than on its own to promote physical activity at a population level.

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