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Stairway To A Healthy Lifestyle: Assessment of stair wrap interventions at UBC

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KIN 464 Health Promotion and Physical Activity

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Executive Summary

Nudges can be used to alter lifestyle choices and encourage daily physical activity (PA). Communication materials and art positioned around stairs may be an effective intervention in encouraging campus-users to take the stairs. This project attempts to explore the impact of stair wraps as a PA intervention. The hope is to encourage individuals to choose to take the stairs instead of easier alternatives to promote physical activity behaviours. A survey was conducted to test the effectiveness of stair wraps or if there is a particular type of installation that promotes the utilization of stairs more.

A mixed method survey of qualitative and quantitative questions targeting University of British Columbia (UBC)'s students, faculty, and staff was used to study stair use in two buildings, the Irving K. Barber Learning Centre (IKB) and the Nest, that have high foot traffic density from people of different backgrounds and faculties. The survey was accessible and shared online to UBC students, faculty, and staff, as well as administered in-person at the IKB and the Nest. However, challenges associated with self-reported data such as surveys include response bias and a tendency for participants to "over report." Survey questions asked were intended to determine what factors influence the decisions to use the stairs or elevator, if the pre-existing stair wraps in the Nest and the Scarfe building that were implemented were effective in promoting stair usage, and what other installations or suggestions would be effective to increase stage usage.

With regards to the stair wraps that were installed in the Nest and the Scarfe building, participants noted the messaging, aesthetics, entertainment value, and accessibility were important factors for the stair wraps to be effective. Factors that hindered the effectiveness of the stair wraps were the lack of visibility and participants viewing it as a distraction and possible safety hazard. Participants' suggestions to improve the stair wraps are as follows; better messaging, more colours, and adding art to increase the aesthetics and entertainment value.

The pre-existing stair wrap initiative can be improved by adding messages aligning with the interest of the UBC community to increase extrinsic motivation. Designing the stair wraps to be more aesthetically pleasing or "instagrammable" can lead to trends and increased sharing on social media and other online platforms. However, based on results, participants indicated a stair wrap was the least favorable installation to promote stair usage. The installation of a fun interactive technology was the most popular, with artwork installation being a close second. Interactive stairs such as the social stairs and piano stairs have been successful global installations that have shown an increase in stair usage. Though it would require further research with regards to the technology used, the design and creation of the structures, and the optimal location of the technology, installation of a fun interactive staircase may be the most effective to promote stair usage.

Introduction

Increased health and wellbeing is important and can be achieved through the increase of PA, such as participating in a recreational activity or as simple as walking more. Meyer and colleagues (2010) noted that PA is critical to health and wellbeing because it is integral to the prevention of cardiovascular disease (CVD). Andersen and colleagues (2003) noted lack of PA was the fourth leading cause of worldwide deaths according to the World Health Organization's (WHO) rankings. These two points highlight the need for PA to achieve health and wellbeing. One way to increase PA is stair use, which can be integrated easily into daily life (Meyer et al., 2010). Stair climbing is considered vigorous PA and can improve fitness (Meyer et al., 2010). An ideal setting for promoting stair use is the workplace due to time spent there (Andersen et al., 2003). UBC is an optimal workplace to promote stair usage for the UBC community; students, faculty, and staff included. Promotional campaigns which use encouraging messages on posters and floor stickers placed at the 'point-of-choice' between stairs and elevators can motivate stair use (Meyer et al., 2010). They are a part of active design, an approach to building development incorporating physical and aesthetic design elements that encourage more PA and social interactions (City of North Vancouver, 2019a). Inclusion of high-quality, inviting, and visually pleasing materials and finishes, and visible signage to promote and direct stair use at elevators can increase PA (City of North Vancouver, 2019b).

The task was to assess the impact of PA 'nudges' or stair wrap interventions on health promotion (HP) at UBC. Griffiths & West (2015) noted that 'nudges' are a conscious endeavour to guide decision making to improve health outcomes by engineering the environment where choices are made (i.e. 'choice architecture'). We endeavour to aid Campus and Community Planning in improving HP by assessing the current average frequency of stair use, the factors that

influence stair use, and the factors which could increase stair usage. We hope that this data will assist in the decision making process on the installation of the most effective stair wrap intervention at UBC. Furthermore, the data will serve as a baseline which can be referenced for assessing the impact of stair wraps after the installation.

Literature Review

Eckhardt, Kerr, & Taylor (2015) investigated the efficacy of point-of-decision interventions to encourage stair use over elevators for lifestyle PA using motivational signs. Thomas, Puig, Senye-Mir, Greenfield, & Eves (2015) discussed that point-of-decision prompts interrupt the "bad" habit at the point of occurrence by encouraging individuals to contemplate their behaviour by enabling a health-enhancing alternative. Also, research supports the claim that the prompts remind individuals to take the stairs (Eves, Webb, Griffin, & Chambers, 2012; Lewis & Eves, 2012; and Olander & Eves, 2011). Even though Thomas et al. (2015) pointed out inconsistencies in the results, successes of the point-of-decision studies in university settings have been reported by Russell, Dzewaltowski, & Ryan (1999) and Coleman & Gonzalez (2001). In addition, studies have consistently shown the effectiveness of point-of-decision interventions to increase stair climbing as opposed to escalator use in public access settings such as airports, shopping malls, and train stations (Brownell, Stunkard, & Albaum, 1980; Kerr, Eves, & Carroll, 2001; Lewis & Eves, 2011; Thomas at al., 2015)

The previous studies' inconsistent results were addressed via a quasi-experimental design to compare the effectiveness of point-of-decision interventions between a baseline group who saw no displayed message (control), a group that saw a general message *"Burn calories. Get healthy"*, and a group who saw a specific message *"Walking up-stairs burns almost 5 times more*

calories than riding an elevator" (Eckhardt et al., 2015). Adults who made decisions between stair use versus elevator use at the University of Texas Health Science Center were observed, and the results indicated that specific message signs significantly increased stair use compared to both baseline (no sign) and the general signs. (Eckhardt et al., 2015). Moreover, in a mixed study by Thomas, Puig, Senye-Mir, Greenfield, & Eves (2015), four prompts which delivered three point-of-decision messages about weight control, fitness, and heart health were explored. Although the article has no clear explanation of why or how, the results demonstrated that messages targeting heart health had the greatest impact; whereas messages targeting respiration rate for fitness had a negative effect (Thomas at al., 2015). In addition, the design of the stairs was identified as a barrier due to their structure, location, and visibility since they were seen as potential safety hazards (Thomas et al., 2015). Furthermore, messages which outline a specific attainable health outcome from stair climbing are most likely to be motivating (Webb & Eves, 2007). These findings demonstrate that point-of-decision interventions with specific signage may be more successful at locations where stairs are visible and safely built.

Peeters, Megens, Van de Hoven, Hummels, & Brombacher (2013) addressed the development of the social stairs by comparing the previously established piano stairs to theirs. They simultaneously aimed for long term behaviour change towards taking the stairs (Peeters et al., 2013). Social stairs is a concept in which a staircase or stairwell becomes a place to "hang out", a meeting spot or place of socialization (Peeters et al., 2013). The piano stairs was a project by The Fun Theory, supported by Volkswagen. They intended to increase usage of the stairs through making them more fun, and thus transformed the stairs into a working piano, each step being a different piano key (Georgia, 2015). They investigated intrinsic motivation and socialization of stair users through an experimental design landscape method. Thus, creating a

design opportunity of social engagement and to generate increased motivation for stair usage (Peeters et al., 2013). In a three week study within a university community, both designs of the social stairs and the piano stairs were highly effective in promoting stair usage and socialization (Peeters et al., 2013). The study also aimed to measure the playfulness of users, dictated by the length of time spent on the stairs, how many stairs each person used, and how they would use them (Peeters et al., 2013). After the three week trial period, there was increased intrinsic motivation to use stairs, increased periods spent on the stairs at a particular time, and stairs became a spot to "hangout" where users would meet as groups to socialize (such as eating lunch and talking) on the stairs (Peeters et al., 2013). The post-trial stair usage displayed great promise for a long term, structural behavioural change; however, to accurately estimate long term change there needs to be multiple trial periods, each lasting over three weeks (Peeters et al., 2013). The study had limitations due to inadequate time for a thorough analysis of positive long term changes in behaviour and intrinsic motivation (Peeters et al., 2013). In addition, constant alterations to concepts such as the tone of the sounds, and the design were made which made it difficult to identify the most beneficial part of social stairs (Peeters et al., 2013). Nevertheless, the study correlates directly to our project as it illustrated how a multitude of factors, such as aesthetics and accessibility, impact stair usage on a university campus like UBC and was effective at increasing the use of stairs and thus PA.

Furthermore, Boutelle, Jeffery, Murray, & Schmitz (2001) discussed how increasing the visual appeal of stairwells or making stair use fun could increase PA in their experiment. Two interventions were applied for four weeks each; the use of signs only for four weeks followed by the addition of music and artworks for four weeks. During the second half of the experiment, the artworks were changed once a week and the music was changed daily. (Boutelle at al., 2001).

There was a significant increase of patrons using the stairs during the later four week intervention when artwork and music were added to the stairwell (Boutelle at al., 2001). However, it cannot be determined if the increase was due to the aesthetic appeal of the art with music or the constant changes of the artworks and music (Boutelle et al., 2001). There may have been limitations in participation because the stairwell was only accessible to key cardholders. Nonetheless, this experiment supported the notion that the design of the staircase should be considered in terms of aesthetics and accessibility to increase stair usage.

Aside from academic research, there are some successful real-life examples of stair wraps. The “Take the Stairs" campaign launched in 2018 by the Healthy Campus Initiative (HCI) at the University of California, Riverside (UCR) is an example that “promote[s] an environment which allows the opportunity for faculty, staff, and students to feel motivated about making small changes to become more physically active” (Martinez, 2018). By installing stair riser decals with witty messages such as *‘burn calories, not electricity’* and bright images, this campaign supports studies that claim the effectiveness of point-of-decision interventions involve using specific health outcome messages (Eckhardt et al., 2015; Thomas et al., 2015; Webb & Eves, 2007). Some real-life examples demonstrate the fun component of stair wraps, such as the piano stairs. The Fun Theory campaign adds fun to mundane tasks in order to change people’s behaviours (Wicke, 2018). Public interventions such as “a piano staircase, a [garbage] bin with a fifty-foot drop [sound], [and] the bottle-bank arcade [with a scoreboard]” were a success that showed adding some fun can increase positive actions (Goodvertising, 2019). The increased positive actions were reflected by 31 Kg more garbage in the fun garbage bin than a nearby regular bin, and by the bottle-bank arcade that was used 50 times more than a nearby regular bottle-bank in a day (Cashmore, 2009). Moreover, the piano stairs installed in a Stockholm

subway station saw a 66% increase in people choosing the piano stairs over the escalator (Cashmore, 2009). Based on the success of the fun theory, implementing something fun and innovative to stairwells can increase the use of stairs. Another example to add more PA into daily life by stair use is through a climbing challenge (The University of Windsor, n.d.). The Workplace Wellness Committee at the University of Windsor held its 20-day long stair climbing challenge in 2017. This event was targeted towards employees of the university (The University of Windsor, n.d.). The rule is that individuals or teams of five track and record the number of flights of stairs taken both up and down on tracking record sheets. Once the sheet was submitted, the participants were automatically entered into a prize draw (The University of Windsor, n.d.). UBC also has a very similar event to encourage staff and faculty to take the stairs. The *Pick Your Peak Stair Challenge* is an annual event to boost cardiovascular health, build muscle, and strengthen the core (UBC, n.d.). This annual event has been successfully implemented in a university setting for the employees, but we imagine the climbing challenge can be more successful if it was implemented as a year-round event and expanded to students. Borrowing the concept of the Grind Timer program from the Grouse mountain (Grouse Mountain, n.d.), the year-around stair climbing event would be a motivator to increase stair usage. By scanning the UBC ID card, the climbs can be recorded electronically and the challenge could elicit more intrinsic motivation as opposed to a prize draw.

With guidance from the literature review, we intend to assess stair use at UBC by considering the factors which currently work to promote stair usage and those that could increase stair usage. We will do this through a survey of members of the UBC community on their preferences for types of stair wrap interventions. Initiatives could include the following; installation of artwork, installation of fun interactive technology, a climbing challenge program,

and point-of-decision signs with specific messages. Based on previous successes in both the academic research and the real-life events on different stair wrap strategies, we hope to assist in finding the most effective stair wrap strategies for UBC.

Methods

HP through stair use on university campuses is nothing new. Adams and White (2002) discussed a stair use intervention in their study on the Newcastle Healthy Medical School Project (NHMSP). They sought to provide an environment that promotes healthier choices to improve and maintain health among staff and students (Adams & White, 2002). In our study, the target population will be similar to that of the NHMSP, i.e. students, faculty, and staff at the UBC. The target population of students, faculty, and staff have been selected to represent the UBC campus community as both a place of study and work. Our reasoning behind this population selection is to align with the goals of SEEDS in promoting healthier lifestyles to all people in our campus community.

In the workplace, increased physical fitness is associated with heightened alertness, improved mental health, productivity, creativity, and lower instances of illness-related absences (Prieske et al., 2019). In addition to increasing fitness, regular PA has been shown to moderate stress and anxiety, boost mood, improve focus and concentration, increase memory retention, and enhance life satisfaction among students (Cabral et al., 2018). According to ParticipACTION (2018), 83% of Canadians reported believing physical inactivity to be a serious health concern and 74% reported enjoying PA. This reveals that although Canadians appear to be interested and educated about PA, current strategies of HP have not been effective in the integration of PA into daily life. Something needs to change about the way PA is promoted.

There has been increasing support promoting lifestyle PA as a means to integrate exercise into everyday activities. Lifestyle PA and point of decision interventions have been shown to accumulate PA throughout the day, meeting PA guidelines (Dunn, 1998).

A survey incorporating mixed methods is employed to study current stair use in the UBC community. The survey considers the factors which currently work to promote stair usage and those that could increase stair usage. Using a mixed methods survey is an appropriate method to address the research question, because a survey can include mixed methods through the use of quantitative and qualitative questions (Baum, 1995). Surveys have flexible data set ranges from small-scale for local needs assessments, such as the UBC community, to large-scale for national and international comparisons of health outcomes (Baum, 1995). According to Baum (1995), neither qualitative nor quantitative methods can fully explain a phenomenon alone, thus a mixed methods approach is useful for understanding how to promote health within a target population. In mixed methods, quantitative questions can include answers relating to the amount of change in behaviours as a result of the intervention (Francisco, Butterfoss, & Capwell, 2001). Our study contains more quantitative elements to provide the majority of data on the average frequency of stair use, factors that influence the stair use, and factors which could increase stair usage; however, there is a small qualitative influence with the inclusion of the "other" option. Through the "other" option, factors influencing stair use and factors which could increase stair use can be expanded, and participants would not be limited to the options that were given in the survey. Since qualitative methods include exploratory questions on the target population and can be employed before establishing an applied intervention to understand what messaging is the most effective (Francisco et al., 2001), it can provide a more elaborate response. This can help guide in-depth understanding and analysis of the target demographic and recognition of the elements

which should be considered for promoting stair use. Moreover, surveys can be completed before and after interventions to assess the effectiveness of HP campaigns (Baum, 1995).

Founded on the project task and the literature review, our research questions build on similar research of Adams' and White's (2002); "How can stair use best be quantified? What makes effective stair promotion signs and can the target population contribute to their design?" (p. 274). We surveyed participants and asked about their current stair usage via factors that influence current stair use, the impact of pre-existing stair wraps on stair use, and the strategies which could potentially increase stair usage. The survey questions and options we posed are similar to that of Blake, Lee, Stanton, & Gorely (2008). Through observational data and questionnaires, they assessed the impact of an environmental stair-use intervention using point-of-decision prompts in a workplace setting in the UK (Blake et al., 2008).

The data collection was conducted inside two primary locations at UBC: 1) The IKB Learning Centre, a multidisciplinary learning and study space used by all faculties, and 2) The Nest, a social hub consisting of restaurants, shops, and casual meeting places. Locations were selected based on foot traffic density, hours of operation and the variety of people who use the space to gain a broad representation of the UBC population. The collected quantitative and qualitative data provides information on the average frequency of stair use over the elevators in ratings, what factors affect their decision in choosing the stairs, and the factors which could potentially increase stair usage (Appendix C). To obtain maximum coverage of the target population considering those who missed the in-person survey or who did not have the time to fill out the questionnaire at the moment, the survey was offered online as well via the UBC Qualtrics site. The in-person survey was conducted twice a day from March 2nd to March 6th, 2020, between 11:00 AM-12:00 PM, and 2:00 PM-4:00 PM, alternating between the two primary

buildings. When the participants of the in-person survey were recruited on the spot, there was a brief introduction to the subject of the survey. Meanwhile, the online survey was conducted from March 2nd, to March 11th, 2020.

In terms of data analysis, descriptive statistics were employed for quantitative data. The majority of the quantitative data was measured by frequency (count, percent, frequency). A table is used to indicate the demographic that the survey reached (Table 1, Appendix C). Pie graphs are used to display the frequency of stair use and the effectiveness of pre-existing stair wraps (Figure 1 and 5, Appendix C). By determining the building with the higher frequency of stair traffic, our client can assess the design of the building and factor which design features influenced people to choose the stairs over the elevator. We acknowledge that our primary buildings may not be accessed by all members of the UBC community, so the "other" option gives us a deeper insight into other buildings that are commonly used.

The results from Q3, Q4, and Q10 (Figure 2, 3, and 6, Appendix C) are represented in column bar graphs. The total number of times an option was selected is displayed in the bar graph which depicts the differences in ranking efficiently in their lengths through the disparity between different categories (Wisconsin Hospital Association, n.d.; Study Pug, 2019). Multiple data sets are more clearly exhibited allowing easy data comparison (Wisconsin Hospital Association, n.d.; Study Pug, 2019), and bar graphs can indicate trends better than keeping the results as a table (Barcelona Field Studies Centre, 2020). The specification of the results when "other" was chosen is not included into the graph; however, additional details and specifications of the responses from "other" are noted under each table and figure and discussed qualitatively. As we investigated each qualitative response, similar contexts are grouped under a common theme and elaborated in our discussion.

The results for Q5 and Q7 are combined and displayed as a stacked bar graph (Figure 4, Appendix C). The stacked bar graph shows the percentage of people who were influenced by the pre-existing stair wraps in their stair use, as well as those who were not influenced by it even though they recall seeing the stair wraps. This is compared to the percentage of people who did not recall seeing the stair wraps. The decision to use bar graphs and pie graphs is due to their strong visual appeal and straightforwardness (Wisconsin Hospital Association, n. d.). For the analysis of qualitative responses from Q6 and Q8 of the survey (Appendix B), the participants' opinions and suggestions on the stair wraps and their thoughts on why the stair wraps did or did not increase their usage of the stairs were grouped into a common theme by similar contexts. Further analysis is conducted in our results/findings section.

Encountered challenges & Mitigation strategies

According to Dr. McEwen's lecture in KIN 373, term one, 2017, surveys are useful tools to measure the subjective experiences of participants. However, challenges associated with self-reported data have the potential to affect the validity and reliability of a study. Response bias was one of our main challenges since it can happen for any of the following four reasons: the social desirability to look better, acquiescence (ie. the tendency to agree), extremity answers to most extreme options, and leniency (ie. giving a response the participant thinks the researcher wants) (McEwen, 2017). In our study, we expected the response bias will be most likely based on social desirability of PA. Also, Brenner and DeLamater (2014) call attention to the tendency for respondents to "over report" on PA surveys. "Over report" occurs when respondents report higher rates or more frequent activity on surveys than actual behaviour (Brenner & DeLamater, 2014). One explanation for this is to present answers that fall within what the respondent

considers to be a “normative answer” in other words, they will give the most socially acceptable answer (Brenner & DeLamater, 2014).

Furthermore, due to the predominant quantitative features in the survey, participant’s responses may be limited to the given choices. There may be a lack of interpretation and thematic analysis of the participant’s experiences due to the general limitations of quantitative methods (McEwen, 2017). A small sample size and in-person surveys fail to achieve random sampling which may challenge our findings to be generalized to those who use the stairs on campus. Moreover, the recruitment for the in-person survey was limited to those who are stationary in the selected buildings because passers-by are less likely to stop and answer the survey. The limitations posed by surveying in the specific buildings may have caused selection bias as the participants do not provide a complete representation of the UBC community. Lastly, we realized that there are a few incomplete survey responses. A total of 90 responses were recorded on Qualtrics but seven of the responses were either empty or uncomplete. The decision was made to remove the seven responses and record our sample size to be N=83. The removal of the seven responses ensures the data we received were from patrons who answered all of the questions with intent, versus someone who was skimming through the survey.

The first issue identified is the likelihood of response bias. Although it is difficult to completely remove the bias, we tried to mitigate the bias by sending out online surveys with a consent form informing of anonymity of the survey. There is evidence to suggest that response bias is less likely to occur online because it is easier to remain anonymous (Heale & Twycross, 2015). Our second challenge was to overcome the issues which occur with quantitative methods. As referenced in the above segment, in order to minimize this challenge, we utilized some qualitative features. Adding qualitative features will include a more mixed methods approach,

such as including the option for “other, please specify” for a better understanding of the reasoning behind the response (Appendix B). Adding qualitative features provides us with further issues such as getting too broad of a discussion. This can lead to insignificant or diluted results and therefore, causing difficulty in finding themes across the responses. Thus, to best minimize this challenge we aimed to have a larger sample size (N=83) than the recommended sample size (N=40 ~ 60) by our client. We hoped that the larger sample size can increase our chances of seeing common themes.

In terms of selection bias, we chose the Nest and IKB as two primary locations of the in-person survey because they are used by the UBC community as a whole. The buildings will not limit sample population to any specific group within UBC considering that they are a multidisciplinary learning and study space used by all faculties, and a social hub consisting of restaurants, shops, and casual meeting places respectively. One thing to note is that we tried our best to mitigate most of the challenges identified in a variety of ways. We acknowledged that the mitigation strategies attempted were to minimize the impact of the challenges but complete elimination of the issues is unlikely.

Results/findings; quantitative data

The survey’s first question serves to identify the target population by asking if the participant is a UBC faculty, staff, or a student (Q1, Appendix B). Among the participants (N=83) in both in-person and online surveys, most of the participants identified as a student (80.72%) followed by staff (12.05%) and faculty (4.82%) (Table 1, Appendix C). Another 2.41% of the participants responded as “other”, specifying that they are: an employee of an onsite company at UBC or alumni (Table 1, Appendix C). There is one response that was specified as

Alma Mater Society staff under the “other” which was counted as staff. Likely, one response that identified them as a student who is working on campus under the “other” is counted as a student.

Out of 83 participants, 82 participants access the IKB (Figure 1, Appendix C). Among the IKB users, 47.56% responded that they always choose the stairs over the elevator when accessing different floors, followed by participants who choose the stairs most of the time (25.61%) (Figure 1, Appendix C). Meanwhile, 7.32% of the participants answered that their choice to use the stairs is about half the time followed by responses that they never choose the stairs (6.10%); whereas, 13.41% said they choose the stairs sometimes (Figure 1, Appendix C). Of the participants who access the Nest (81 participants), 40.74% responded that they always choose the stairs over the elevator when accessing different floors followed by those who choose the stairs most of the time (27.16%) (Figure 1, Appendix C). Meanwhile, 9.88% of the participants choose to take the stairs about half the time, which is followed by responses from those who never choose the stairs (8.64%); whereas, 13.58% choose the stairs sometimes (Figure 1, Appendix C). The fact that the responses to "about half the time" is rated the second lowest by both the IKB and the Nest users indicates that the participants have a preference that they maintain. Those who choose the stairs over the elevators tend to do so in the majority of their decision, whilst those who choose the elevator over the stairs repeatedly do so, displaying a lack of variability. A similar trend is displayed regarding the participants' responses to other UBC buildings which they access (Figure 1, Appendix C). Out of 34 responses, 44.12% responded that they always choose the stairs over the elevator when accessing different floors, followed by participants who choose the stairs most of the time (20.59%) (Figure 1, Appendix C). Meanwhile, the participants who answered that their choice of the stairs is either about half the

time or sometimes is 29.42%. Also, 5.88% said that they never choose the stairs over the elevator (Figure 1, Appendix C).

Participants were asked to select from ten given options that influenced their choice of taking the stairs over the elevator. The top five options that received the most responses were: the waiting time for the elevator (14.90%), preference to be physically active (14.61%), visible location of the stairs (13.75%), the number of floors to the destination (13.75%), and multiple access points for the stairs (10.03%) (Figure 2, Appendix C). There are a few responses under "other" (1.43%) that offer interesting perspectives (Figure 2, Appendix C). One of the responses indicates psychological or safety concerns on using the elevators (ie. "[I'm] scared of elevators") similar to our option of "less people are on the stairs so I feel less anxious," while another response expresses a health concern (ie. "elevators make you fat") (Figure 2, Appendix C). Responses regarding environmental concern (ie. "better for [the] planet if I take stairs") and ensuring accessibility for those who need the elevators (ie. "[I] want to make sure the elevator is accessible for those that need it and can't take the stairs") (Figure 2, Appendix C) were factors we did not consider when constructing the survey.

The top five factors that influenced choosing the elevator over the stairs are revealed by Q4 in the survey (Q4, Appendix B): peer pressure (16.49%), the number of floors to the destination (16.15%), heavy belongings (14.43%), time available to wait for the elevator (11.34%), and perspiration (9.62%) (Figure 3, Appendix C). Also, three responses in the "other" category indicated that heavy belongings affected their decision (ie. "moving furniture", "heavy load", and "I need to use the staff elevator if I am bringing things upstairs.") (Figure 3, Appendix C). Including these three responses would change the response to heavy belongings to 15.46% with no changes to the original ranking. One of the "other" responses highlighted the frequency

of the stair use (ie. “I’m going up and down multiple times”) as a factor that influences taking the elevator over the stairs (Figure 3, Appendix C). The rest of the “other” responses indicated that there are some people who are insignificantly affected by extrinsic reasons for taking the elevator over the stairs. Some of the feedback included comments such as “I despise using the elevator” and “Never” (Figure 3, Appendix C).

While the preference to be physically active through stair use (ie. “I like the exercise; it keeps me moving”, Figure 2, Appendix C) is the second most popular response in selecting the stairs over the elevator; already completing sufficient PA (ie. “I already do quite a bit of physical activity”, Figure 3, Appendix C) is the ninth reason for selecting the elevator over the stairs. The preference to be physically active by using the stairs does not seem to elicit a sense of significant accomplishment (ie. “I feel better knowing I chose the stairs over the elevator (feeling of accomplishment)”, Figure 2, Appendix C) as a sense of accomplishment is ranked fourth.

In terms of visibility and accessibility of the stairs, they were the third and fifth most popular responses for choosing the stairs over elevators, respectively (Figure 2, Appendix C). These results corresponded to the accessibility of stairs (ie. “the location of the stairs is difficult to access”) being the eighth reason why the elevator is chosen over the stairs (Figure 3, Appendix C). In addition, considering the number of floors to the destination is the third reason why people chose the stairs over the elevator (Figure 2, Appendix C), and the second reason why the elevator is chosen over the stairs (Figure 3, Appendix C). We can deduce that the number of floors is a factor that significantly influences the decision-making process of choosing to take the stairs or elevator based on our results.

Peer pressure (ie. “I am with a group of friends who choose the elevator”) is ranked as the top reason for selecting the elevator over the stairs (Figure 3, Appendix C). Meanwhile

juxtaposed to this, the influence of peers has a less significant yield on choosing the stairs over the elevator (ie. “my friend decided to take the stairs so I do too”) being ranked sixth (Figure 2, Appendix C). This seemed to convey that a group of peers would most likely choose the elevator over the stairs, and the peer influence is significant when with a group. When choosing the elevator over the stairs, it is worth noting that responses related to negative outcomes of using the stairs are at the lower ranks. These responses are ranked fifth, sixth, and seventh: perspiration (ie. “I don't want to break a sweat”), “ I don't want to feel tired after I get to my destination,” and “ I don't like the feeling of being out of breath,” respectively (Figure 3, Appendix C).

Participants were asked to recall the pre-existing stair wraps inside the Nest or Scarfe (Q5, Appendix B). 71.08% responded that they remembered seeing the stair wrap at either building while 28.92% said they recall seeing neither of the stair wraps (Figure 4, Appendix C). Of those who remembered seeing the pre-existing stair wraps, the majority (55.42%) said that the stair wraps did not contribute to increasing their use of the stairs (Figure 4, Appendix C). Moreover, when participants were asked whether or not inclusions of stair wraps would increase motivation to use the stairs in the future, 30.12% answered “no” and 48.19% of the respondents answered “neutral” (Figure 5, Appendix C). These results corresponded to the earlier answers about stair wrap contributions to increasing use of the stairs. Reflecting on the responses to these questions, it can be interpreted that the pre-existing stair wraps did not have an impact on increasing stair usage or motivation to do so. Or alternately, it can be assumed that the two are unrelated.

The most popular answer to what installations would most motivate participants to use the stairs (Q10, Appendix B) is the installation of fun interactive technology (24.85%) followed closely by the installation of artwork (23.64%) (Figure 6, Appendix C). Meanwhile, stair wraps

was the least popular answer of 11.11% (Figure 6, Appendix C). Other well received installations were the climbing challenge (16.36%) and the inspirational/motivational signage (14.55%) (Figure 6, Appendix C). These results coincided with the previous interpretations of pre-existing stair wraps, displaying no relation or insignificant effect of the stair wrap to increase stair usage or motivation. Three out of 13 responses under the "other" category were identified as suggestions on stair wrap design, building infrastructure, and incentives (ie. Care Bear stairs, lack of elevators, and free food respectively) (Figure 6, Appendix C). Interestingly, one participant stated that internal factors would motivate them to use stairs, while eight participants stated that they do not need motivation (Figure 6, Appendix C). This can be interpreted as they do not need external motivation . Another participant suggested showing the number of calories burned would motivate them (Figure 6, Appendix C).

Results/findings; qualitative data

Q6 (Q6, Appendix B) provided some of the qualitative data behind stair usage. The three main sections to this question are as follows: positive feedback, negative feedback, and suggestions for improvement. Under each section main themes were found.

Positive Feedback

With regards to positive feedback, the following themes were deduced from the responses: messaging, appearance/aesthetics, entertainment value, and accessibility. Messaging was mentioned as the most prevalent theme with appearance/aesthetics, entertainment value, and accessibility following in descending order.

For messaging, some of the comments included statements like; "eye catching, good marketing initiative," "clever messaging," "smart to promote stair use on the stairs," "really like

the ones with cute decorations or interesting quotes," "bright colours are good and have relevant phrases that are attention grabbing- 'Instagrammable,'" "Can be beneficial in terms of encouraging students to be more active," and "motivating." This indicates that the messaging included in a stair wrap intervention is integral to its success in motivating people to take the stairs instead of the elevator. For appearance/aesthetics, the key comments included the following phrases; "nice way to brighten up buildings- spaces more welcoming," "make stairs more attractive," "colourful and attract attention more easily," "nice aesthetics and decorations- not necessary but nice change from grey concrete," "pretty and the colours seem to stimulate a response in which it becomes a little more desirable to take the stairs," "cool, like the look," and "eyes immediately drawn to it."

For entertainment value, the main ideas included short comments such as; "something to be entertained by when walking up the stairs," "funny comics or words," "fun and creative," fun and positive," "nice little distraction," and "like reading it as I walk up stairs." The last theme mentioned was accessibility. This theme only appeared in two word bites, for example, "helpful," and "make stairs easier to find."

Negative Feedback

Feedback was not all positive. For this section two main themes came out of the comments included in the surveys. Visibility was the most mentioned with distraction and safety being the lesser mentioned themes.

For visibility, the main comments were as follows; "rarely pay attention because too focused on where heading," "usually only people who take stairs notice them, not a motivator," "existing stair wrap not noticeable," "too lazy to read," "kind of bleak, just green," and "not very visible." Safety and distraction were indicated as negative influences on the effectiveness of stair

wrap interventions. The commentary made in the surveys are as follows; “distracted by smaller text (harder to read) poses a danger,” “usually one line per stair level which can be a little harder to read when you’re walking up fast and trying not to block the way,” “walk slower due to reading banners,” and “difficult to walk and read decals.”

Suggestions for improvement

Participants provided suggestions for improvement of the stair wrap interventions in order to make them more effective. The themes presented in these suggestions are as follows in descending order: words/messaging, colours, images/art, entertainment value, and location.

Words/messaging had by far the most suggestions provided. Highlights of the comments provided are as follows: “add reminders of specific benefits in body through stair use- motivational quotes from interesting people,” “could have facts about how much electric energy it uses to take lift compared to the stairs to touch on the environmental conscious aspect,” “use stair wraps for other ads- like mental health/financial resources and other non-physical activity topic but relate to general wellness,” “good place for advertisements,” “make visible, bigger font- more visible,” “message needs to be more clear,” and “nice way to motivate.” Some more neutral suggestions were as follows: “they're eye catching enough that I read them when passing by, but not really memorable enough that I would remember later in the day,” “influence on intrinsic desire is debatable,” and “neat- not sure would work though.”

For the colours theme, the following comments were especially informative: “bright colours or the UBC colours (but with bright blue, golden yellow and white),” “brighter colours, that way they are more visible and attracting to people walking by,” ”bright colours better attention grabber,” and “attracted to colour more than words.” In the images/art theme the notable suggestions are: “images better than words, less words,” “more artistic would make them

more noticeable," "more engaging designs- better attention grabber," and "smart but could be more creative."

Entertainment value factored in the suggestions through the following comments; "something more fun could be better at being motivational," "wish there were more with funnier tips that are more amusing," and "didn't like the execution of the ones in the photos- something more eye-catching would motivate more- something fun would be nice." Location was indicated the least but included the following two comments; "prioritized in buildings where stairs are near elevators- try to draw people in- would be nice to see in other places like LIFE building," and "more likely to take stairs if [the] building did not have [an] elevator."

Question 8 (Q8, Appendix B) sought to understand why or why not those who recalled seeing the pre-existing stir wraps thought the stair wrap intervention was motivational in increasing PA through stair choice. The responses fell into three categories, motivational, neutral, and non-motivational.

Motivational

Under the motivational category, there were three themes, messaging, extrinsic motivation, and intrinsic motivation. Many participants made comments on the specificity of the messaging that served to motivate them to choose the stairs. For extrinsic motivation, some participants commented that they felt like the stair wraps nudged them to take the stairs, whereas they may not have chosen to do so on their own volition. Several participants noted that taking the stairs is a default choice with stair wraps not being a factor in decision-making.

Messaging

The key comments included with regards to messaging are as follows. "I usually take the stairs due to personal traits but if I were to see how many calories I lose by walking up this

specific set of stairs, I think it would make me more motivated and positive to take the stairs." "It makes the stairs more inviting and positive reaffirmation by doing so and reading the different things they say." "I like to read what it says completely so I feel more inclined to use the stairs." "The messaging was clever and got me thinking about being more active." "It's fun reading them."

Extrinsic Motivation

In extrinsic motivation the essential comments are as follows. "It was more attractive than encouraging to engage in physical activity, [and] increases awareness but not necessarily engagement." "They made them more noticeable/almost instilled a feeling of guilt." "It made me feel targeted/reminded me of the stairs." "It made me feel more encouraged to use the stairs more often." "It's appealing and I took notice [of] the stairs more." "[It] served as a reminder to be more active." "It helped motivate me to use the stairs more often." "Since I recognize that some thought and effort was put in for setting up these stair wraps, it makes me want to use the stairs."

Intrinsic Motivation

For intrinsic motivation these are the following principal statements. "I use [and] prefer the stairs over elevators most of the time." "I try my best to always use the stairs!" "I'm bound to use the stairs either way since most buildings I go to don't have accessible elevators." "I take the stairs regardless, so I didn't really need the wraps to encourage me to take the stairs."

Neutral

Included in the neutral category were the following themes, apathy/indifference and habitual use. According to the responses, many participants held apathetic or indifferent opinions with regards to stair wrap interventions. Also the responses showed that several participants already use the stairs more so than the elevator.

Apathy/Indifference

The key comments made by participants in this theme follow. “I don’t understand how it would increase my usage... stairs are stairs just take them." “I still think stairs are stairs whether they’re wrapped or not.” “Sometimes I am running between spaces and I don’t have time to use all the stairs. I need more motivational words on the stair wraps.” “Whether or not I take the stairs would not depend on stair wraps.” “They’re just stairs.” “I am indifferent to them, I don’t really need them.” “It doesn’t really [affect] me positively or negatively.” “Because [the] place that I take the stairs does not have these stair wraps so [I] don’t see them often to see how it would [affect] me.” “I was not aware of any effect that might exist.”

Habitual Use

The main comments made regarding habitual use are as follows. The most common statement made, “I use the stairs anyways” or something very similar to that. Other statements were made as well, such as the following. “I would use the stairs regardless of the stair wrap.” “I use the stairs regardless.” “I think I've already decided to use the stairs by the time I noticed the stair wraps.” “I take the stairs for practicality reasons.” “I already use the stairs more and often use the smaller stairwells that don’t have wraps.” “I am already aware of the health benefits of taking the stairs and does not influence on my decision to take the stairs.” “I’m bound to use the stairs either way since most buildings I go to don’t have accessible elevators.” “I already use the stairs almost exclusively.” “Didn’t matter. Taking the stairs is my habit.”

Non-motivational

Within the non-motivational category, the following themes surfaced, visibility, activity level, and ineffective. Several participants commented on the visibility of the stair wraps, indicating a lack of visibility until they were actually on the stairs. Activity level was mentioned

as a determining factor in stair choice. Participants made comments which indicated the stair wrap interventions were ineffective.

Visibility

For the visibility theme, the following statements were made. “The only time I saw them was when I had already [chosen] to use the stairs, so they did not influence my choice.” “Unless I couldn’t find the stairs before the wraps were placed, the wraps would not change whether I walk or use the elevator.” “I didn't see them until I was already on the stairs.” “Too lazy to read. Not eye catching.”

Activity Level

For activity level, participants made the following statements. “I take the stairs regularly either way, so this factor did not [affect] my decision at all.” “Because I feel like I already walk a lot on campus to get to classes.” “My bag is usually really heavy and I don’t want my shoulders to be more sore than they already are.”

Ineffective

In the ineffective theme, participants made the following comments. “[It] does not nudge me or motivate me to use the stairs in lieu of the elevators.” “It doesn’t affect my reasoning for using the elevator.” “I don't read them.” “It was pandering.”

Discussion

Our objective for this research was to provide valuable data to Campus and Community Planning by providing a snapshot of current stair use in our UBC community. Our analysis of the data collected has provided numerous significant insights that we hope can aid in building effective future stair wrap interventions and assist with future research.

The survey first established participant demographics (Table 1, Appendix C). Most of our participants were students (80.72%.) We recommend that future studies include methods of data collection that target faculty and staff because UBC is their workplace and their feedback may provide valuable insights from a more diverse age group. The majority of the respondents indicated a preference for using the stairs in both the Nest and IKB. These findings show a high propensity for lifestyle PA decision making. The percentage of stair users was slightly higher in IKB suggests further questioning to understand the reason behind this. We recommend that future research focus on the group who answered "I never take the stairs" as the target population as this particular cohort will provide richer data with regards to building a strategy to increase PA of students who prefer the elevator. One interesting take away from this question was that the answer "I take the stairs half of the time" was among the lowest ratings. This may indicate that the choice is habitual rather than affected by a point of decision prompts such as the pre-existing stair wraps.

When asked what the predominant reasoning was for preferring the stairs over the elevator, participants ranked being in a rush of the most importance (Figure 2, Appendix C). Similarly, in the top three rankings was "*visible location of stairs."* Both are decisions based on convenience. We received a multitude of significant responses in the *"other."* Two responses that may be of specific interest to our partners were attention to the environmental impact of elevator use and concerns about accessibility of the elevators for students in physical need.

These findings speak to the ideology that in order to remove PA barriers, it is important for planning to facilitate healthy choices as the easiest choices as discussed in KIN 464 by Dr. Bundon. Perhaps this is something to be considered at the design level. Structures could be designed to make the stairs an architectural and social focal point of the building with the

intention to direct the flow of traffic through stairways as opposed to elevators. The concept of Active Design employed by the City of North Vancouver (2019a) indicates that location, design elements, and visibility are key influences which dictate whether or not people will naturally take the stairs. The Active Design guidelines state that the primary stairs should be the most conspicuous and enticing means of vertical transport in a building while still supporting clear elevator access for those with mobility constraints (City of North Vancouver, 2019a).

On the opposite end of the spectrum, we asked those who preferred the elevator most to choose from a number of options to explain this decision. In this instance, the number one answer had social influences. Participants stated being with a group of friends who were taking the elevator influenced them to take the elevator. This is beneficial information as it illuminates the values of the elevator favouring demographic. Knowing that social connections are of the most importance among this group provides essential information about how to build an appropriate intervention design. This could be evidence that this group may benefit from social media or group challenge interventions with friends.

The number of floors to the destination is the third reason why people chose the stairs over the elevator and the second reason why the elevator was chosen over the stairs. We can deduce that the number of floors is a factor that influences widely in the decision-making on the use of the stairs or the elevator.

71.08% of participants reported noticing the stair wraps while only 15.66% of respondents reported being influenced to increase stair usage (Figure 2, Appendix C). Similar responses can be seen in (Figure 6, Appendix C) where respondents revealed stair wraps to be the least popular choice when asked what would inspire taking the stairs in the future. Due to

these findings, the qualitative portion of the study becomes extremely important as the individual feedback will provide us with possible explanations for our statistical findings.

The qualitative data on whether or not participants found the pre-existing stair wraps to be encouraging PA interventions produced helpful insight. The data was organized thematically into three categories: positive, negative, and suggestions.

Elements that participants reported enjoying the most were; entertaining, clever, humourous, and “instagrammable” messaging. Regarding aesthetics, people enjoyed how the wraps made the stairs more attractive and more inviting. The negative feedback reported visibility issues, we received statements about how the current colours were not bright enough, how the messages were difficult to read while walking up and there was mention of how the stair wraps were only visible to those who were already on the stairs. There was also some concern in regard to safety as respondents reported feeling that walking and reading felt unsafe.

The suggestions we received about how to improve the pre-existing stair wraps may be of great worth to our campus partner. Participants suggested that the campaign be extended throughout the campus and not limited to signage on the stairs. Bright vibrant colours were proposed with simple, creative, and attention-grabbing imagery. Participants advised having interest in messaging which includes specific health benefits to choosing the stairs. Two other excellent ideas suggested facts about the positive environmental impact stair use provides as an incentive to take the stairs and the idea of cross-promotion with other campus wellness campaigns. This qualitative portion becomes extremely important as the individual feedback will provide us with possible explanations for our statistical findings. The question asking about effectiveness of the pre-existing stair wraps was probably the most significant of the whole survey. The fact that a small number of participants were positively influenced by the pre-

existing stair wraps makes evident the needs for improvement. The most popular reasons cited by these participants were seeing the messages made taking the stairs more fun, and that the wraps provided positive affirmations to stair users making them feel good about their choice. Some participants commented about feelings of guilt caused by the signage, motivating them to use the stairs.

The majority of participants reported either neutral or non-motivational feelings towards the stair wraps. The qualitative responses were somewhat limited in this group. Some of the feedback received reflected indifference, and some participants noted that the stair wraps had no influence on the choice to take the stairs. This provides further evidence that a campaign may be more effective by adding multiple components to engage the community as well as expanding the signage to include other areas where they can be seen by a demographic who is not already taking the stairs. The answers given by participants about what they would find motivating in the future are aligned with our findings throughout the survey. The participant answers reflect the interest in a multidimensional stair use intervention campaign.

Recommendations

After consideration of the quantitative and qualitative analysis of the survey results, there are a few notable aspects that merit examination for future recommendations. The first notable aspect is that the top factors influencing the use of the stairs are both extrinsic and intrinsic (Figure 2, Appendix C). The extrinsic factors are the waiting time for the elevator, visible location of the stairs, the number of floors to the destination, and multiple access points for the stairs; whereas, preference to be physically active can be considered as an intrinsic factor. Similarly, reasons for choosing the elevator over the stairs conveyed both extrinsic and intrinsic

factors. The extrinsic factors are coming from their peers, the number of floors to the destination, heavy belongings, and time available to wait for the elevator; whereas, undesired perspiration can be considered as an intrinsic factor. Since four of the top five factors in both choosing the stairs over the elevator and choosing the elevator over the stairs are extrinsic factors, altering extrinsic factors seems appropriate to make a positive change in the number of people choosing the stairs over the elevator by improving the built environment of the social-ecological model. In addition, as we found in earlier analysis on the frequency of the stair use, the participants who choose the stairs over the elevators tend to do so in the majority of their decisions, whilst those who choose the elevator over the stairs repeatedly do so. In the qualitative responses, many participants have commented on the specificity of the messaging that served to motivate them to choose the stairs. For messaging being an extrinsic motivation, some participants said they felt like the stair wraps nudged them to take the stairs, otherwise, they may not have chosen to do so on their own volition. Several participants noted that taking the stairs is a default choice with stair wraps not being a factor in decision-making. This trend shows preference or having a habit of making the same choice. Larocca, Yost, Dobbins, Ciliska, & Butt (2012) state that often extrinsic motivation is required to get specific people started, which will later become a habit.

In the light of the qualitative responses regarding words/messaging on the stair wraps and the “other” responses for factors influencing on choice of the stairs over the elevator (Figure 2, Appendix C), the existing stair wrap initiative can be improved by creating stair wraps which target extrinsic motivation through messages that are of interests to the UBC community. For instance, stair wraps messages conveying health concerns/benefits, environmental benefits, or assurance on accessibility for those who need the elevator most, may positively influence on

choosing the stairs over the elevator may bring positive impact frequency of the stair use. Thus, there are a few options for the message(s) which could be displayed on the stair wraps:

- A message regarding health concerns/health benefits; “stairs benefit the body …”, including the calories burned per staircase, or having the stairs numbered for step counts.
- A message regarding environmental awareness; “saving the environment one step at a time.”
- A message regarding assurance on accessibility; “use the stairs so that those who can’t have access to the elevator”

By displaying messages similar to the above, it will extrinsically motivate those using the elevator to perhaps use the stairs instead. These messages may evoke feelings of guilt or feelings of goodness because some people and much of humanity will choose a route that can lead them to feel less guilt or more accomplishment.

Moreover, creating more eye-catching, fun, and aesthetic stair wraps can improve the current initiative of stair wraps. The pre-existing stair wraps which were included in our research were plain green with the logo of MoveUBC printed on them. When the participants were asked to recall their memory on the pre-existing stair wraps inside the Nest or Scarfe (Q5, Appendix B), 71.08% responded that they remember seeing the stair wrap at either building while 28.92% said they recall seeing neither of the stair wraps. Of those who remembered seeing the existing stair wraps in either of the buildings, the majority (55.42%) said that the stair wraps did not contribute in increasing their use of the stairs (Q7, Appendix B). Moreover, when participants were asked whether or not inclusions of stair wraps would increase motivation to use the stairs (Q9, Appendix B), 30.12% answered with no and 48.19% of the respondents answered with neutral. Besides, the qualitatively gathered feedback on the pre-existing stair wraps conveys aesthetically pleasing “instagrammable” design is desired and would cater to increased traffic on

the stairs. According to Heale & Twycross (2015), trends that can be shared through social media or can be incorporated into their online lives, are more inclined to be used especially in the university-aged population. The “instagrammable” stair wraps would encourage the stair use via its noticeability due to more images of the stairs being shared and liked through social media and social networks targeting especially university-aged people who are inclined towards sharing trends on their social media. The desire for aesthetically pleasing stair wraps is further reflected via the second popular response to what would most motivate participants to use the stairs (Figure 6, Appendix C), the installation of artwork. The success of the improved design of the stair wraps in increasing stair use can be measured by social media traffic, foot traffic on the stairs, and qualitative feedback.

Meanwhile, the installation of fun interactive technology is the most popular response to what would most motivate participants to use the stairs (Figure 6, Appendix C). Implementing such a stair wrap strategy will require a new initiative, which takes on a more dynamic, technological route than purely stair wraps. The new initiative would involve the creation of interactive stairs, such as the social stairs and piano stairs which were previously mentioned in the literature review section. While the installation of fun interactive stairs has shown success via the social stairs and piano stairs, this recommendation would take longer to implement as it would require the implementation of technology and construction of structures such as incorporating lighting in the handrail bars to light up in different colours or auditory technology to produce a sound. In order to progress with this recommendation, the client would need more research on possible locations, designs, effectiveness, safety and ethical concerns, and policies. They would also need a consultation with stakeholders and a trial period. A good indicator of the

success of the interactive social stairs would be increased foot traffic on the stairs as well as increased time spent on the stairs.

The final recommendation would be the expansion of an existing initiative, the *Pick Your Peak Stair Challenge* as discussed earlier in the literature review section. Keeping in mind that peer pressure has notable influences on both selecting the elevator over the stairs and choosing the stairs over the elevator (Figure 2 & 3, Appendix C), having an activity that people can participate in groups or compete against each other could encourage stair usage as well. We imagine the climbing challenge, *Pick Your Peak Stair Challenge* can be more successful if it was implemented as a year-around event borrowing the concept of the Grind Timer program from the Grouse mountain (Grouse Mountain, n.d.) and expanding it to students. By scanning the UBC ID card at checkpoints on any lower floor when starting the challenge and on the upper floor at the end of the climbs, the accomplishment will be recorded electronically. The electric record will allow the users to track the number of stairs they have climbed and the number of staircases they have conquered. A smartphone app that tracks challenge progress could assist in increasing motivation to use the stairs. Furthermore, the app would allow sharing of the accomplishment via social media which can assist in increasing publicity of the challenge, thus resulting in increasing stair use. Also, offering prizes for accomplishing certain challenges/goals could entice the users to be further extrinsically motivated. We anticipate that the client would need more research on possible locations, technological infrastructure, effectiveness, safety and ethical concerns, and policies. They would also need a consultation with stakeholders and a trial period. The success of the climbing challenge can be measured by the automatically collected data via the checkpoint scanners and smartphone app.

With the appreciation of the digital HP, the involvement of social media and digital technology in the above recommendations seem appropriate. In a lecture on digital HP, Dr. Bundon discussed that HP has always engaged with the media and drawn on theories and practices from media studies. Additionally, Dr. Bundon has mentioned that there are studies that have shown that social media encourages health improvement and behaviour.

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Appendix A

KIN 464: Health Promotion and Physical Activity

Participant Consent Form for Class-based Projects

Stair Wrap Interventions

Group 7

Principal Investigator:

Dr. Andrea Bundon (Assistant Professor, School of Kinesiology, Faculty of Education)

The purpose of the class project:

To gather knowledge and expertise from community members on the impact of stair and elevator wraps as physical activity interventions. The hope is to encourage individuals to choose to take the stairs instead of easier alternatives to promote physical activity behaviours. We would potentially look to test the effectiveness of a stair wrap or if there is a particular type of installation that promotes the utilization of stairs.

Study Procedures:

With your permission, we are asking you to participate in a survey. With the information gathered, students will critically examine how different individuals understand or engage in health promoting activities or health promotion initiatives.

Project outcomes:

The information gathered will be part of a written report for the class project. The written report will be shared with campus partners involved with the project. Summaries of findings will also

be posted on the following websites. ***No personal information/information that could identify participants will be included in these reports or shared with campus partners.***

UBC SEEDS Program Library:
https://sustain.ubc.ca/courses-degrees/alternative-credit-options/seeds-sustainability program/seeds-sustainability-library

Potential benefits of class project:

There are no explicit benefits to you by taking part in this class project. However, the interview will provide you with the opportunity to voice your opinion on your experiences with health promoting activities or initiatives in a broad sense and will provide the students with an opportunity to learn from your experiences.

Confidentiality:

Maintaining the confidentiality of the participants involved in the research is paramount, and no names of participants will be collected.

At the completion of the course, all data (i.e. notes) and signed consent forms will be kept in a locked filing cabinet in Dr. Andrea Bundon's research lab (1924 West Mall) at the University of British Columbia. All data and consent forms will be destroyed 1 year after completion of the course.

Risks:

The risks associated with participating in this research are minimal. There are no known physical, economic, or social risks associated with participation in this study. You should know that your participation is completely voluntary and you are free to **withdraw from the study** and there will not be negative impacts related to your withdrawal. If you withdraw from the study, all of the information you have shared up until that point will be destroyed.

Contact for information about the study:

If you have any questions about this class project, you can contact Andrea Bundon by phone at 604-822-9168 or by email at andrea.bundon@ubc.ca

Research ethics complaints:

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or e-mail RSIL@ors.ubc.ca . or call toll free 1-877-822-8598.

Consent:

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time.

By proceeding to the next page you consent to the terms.

Appendix B

Q1. Are you a UBC faculty, staff, or a student?

- ○ Student
- ○ Faculty
- ○ Staff
- ○ Other_____

Q2. How often do you choose the stairs over the elevator when accessing different floors of the following two buildings?

* If you do not access IKB or the Nest, indicate what other two buildings you access frequently.

	Never	Sometimes	About half the time	Most of the time	Always
Irving K. Barber Learning Centre (IKB)	○	○	○	○	○
The Nest	○	○	○	○	○
Other	○	○	○	○	○
Other	○	○	○	○	○

Q3. What factors influence you to choose the stairs over the elevator? Select all that apply.

- [ ] Multiple access points for the stairs
- [ ] Visible location of the stairs
- [ ] I like the exercise; it keeps me moving
- [ ] I feel better knowing I chose the stairs over the elevator (feeling of accomplishment)
- [ ] I am usually in a rush; I don't have time to wait for the elevator
- [ ] There are no elevators
- [ ] My friend decided to take the stairs so I do too
- [ ] The number of floors I intend to go/the number of floors my destination is on
- [ ] Less people are on the stairs so I feel less anxious
- [ ] The stairs are easier for me
- [ ] Other _____

Q4. What factors influence you to take the elevator over the stairs? Select the top 5 which apply to you.

- [ ] I don't want to break a sweat
- [ ] I don't like the feeling of being out of breath
- [ ] I don't want to feel tired after I get to my destination
- [ ] I am with a group of friends who choose the elevator
- [ ] I have the time/leisure to wait for the elevator and not rush up the stairs
- [ ] My body cannot handle much physical activity due to mobility/balance/vision issue
- [ ] My bag and other belongings are too heavy
- [ ] I already do quite a bit of physical activity
- [ ] The number of floors I intend to go/the number of floors my destination is on
- [ ] The location of the stairs is difficult to access
- [ ] I don't feel safe using the stairs
- [ ] Other_____

Q5. Do you recall seeing stair wraps inside the Nest or Scarfe? (Referenced below)

* Stair wraps are artistic/motivational decals

- ○ Yes
- ○ No

Q6. What is your opinion of the stair wraps? Are there any tips or suggestions you have?

_____

_____

_____

Display This Question:

*If Do you recall seeing stair wraps inside the Nest or Scarfe? (Referenced below) * Stair wraps are... = Yes*

Q7. Did the stair wraps increase your usage of the stairs?

- ○ Yes
- ○ No

Display This Question:

If Did the stair wraps increase your usage of the stairs? = Yes

Or Did the stair wraps increase your usage of the stairs? = No

Q8. Why or why did it not increase your usage of the stairs?

_____

_____

Q9. Would inclusions of a stair wrap motivate you in the future to use the stairs more often?

- ○ Yes
- ○ Neutral
- ○ No

Q10. What change would most motivate you to use the stairs?

- ☐ Installation of artwork
- ☐ Installation of fun interactive technology
- ☐ Climbing challenge program
- ☐ Signs with inspirational/motivational messages
- ☐ Stair wraps
- ☐ Other_____

Appendix C

Table 1

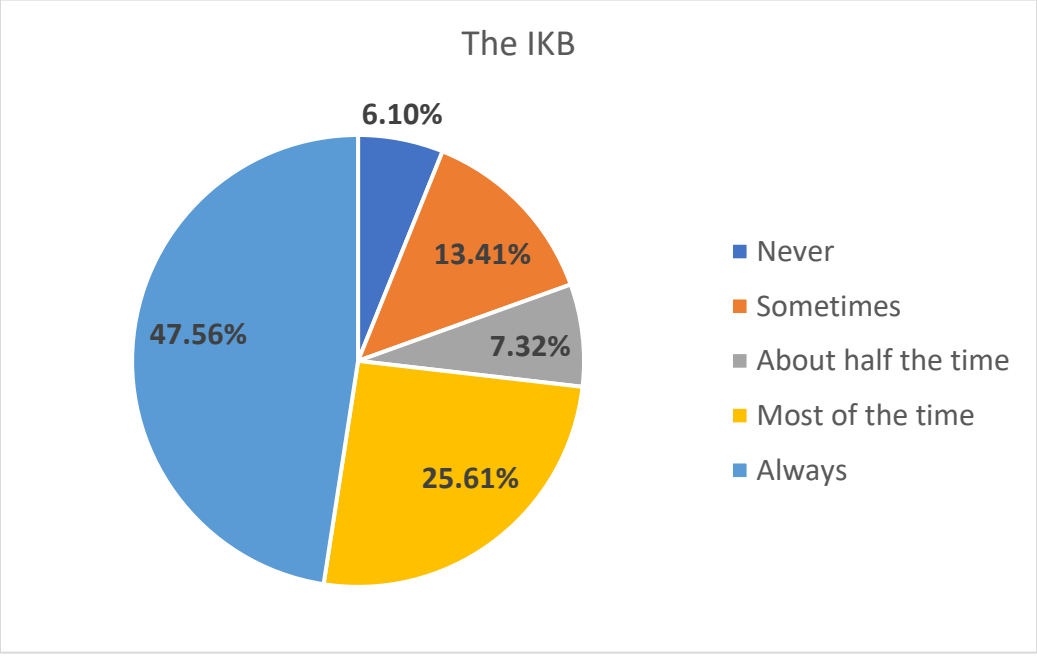
Demographic of participants

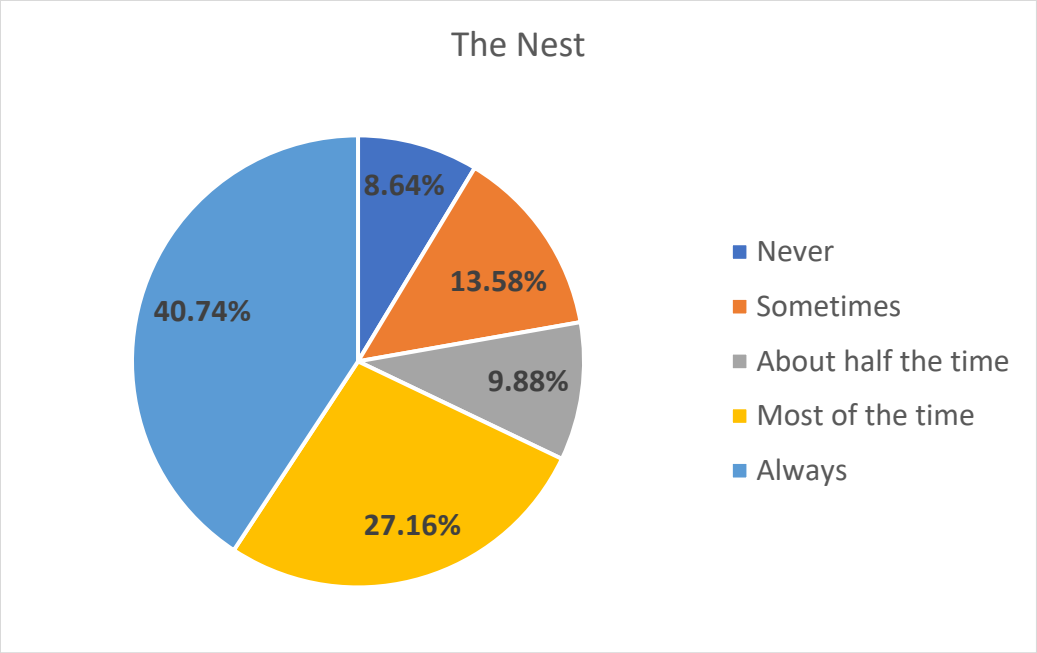
Status	Percent	Count
Student	80.72%	67
Faculty	4.82%	4
Staff	12.05%	10
Other	2.41%	2
Total	100.00%	83

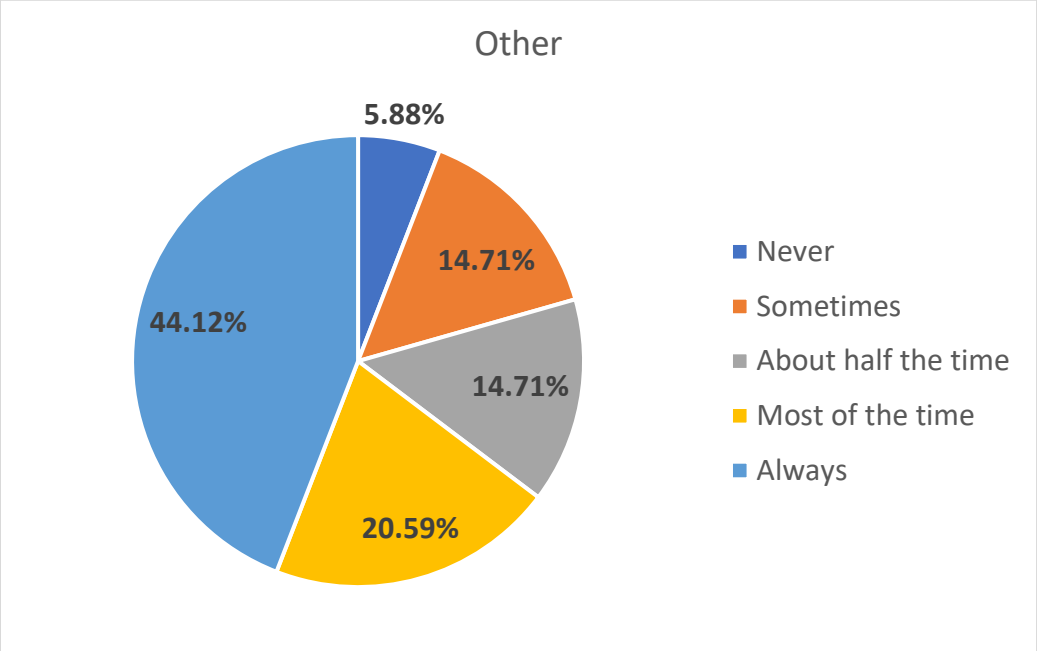
Note. N=83. "Other" responses included: "alumni" and "employee in a company onsite at UBC."

Figure 1

Frequency of choosing the stairs over the elevator at the two target buildings and other buildings at UBC campus



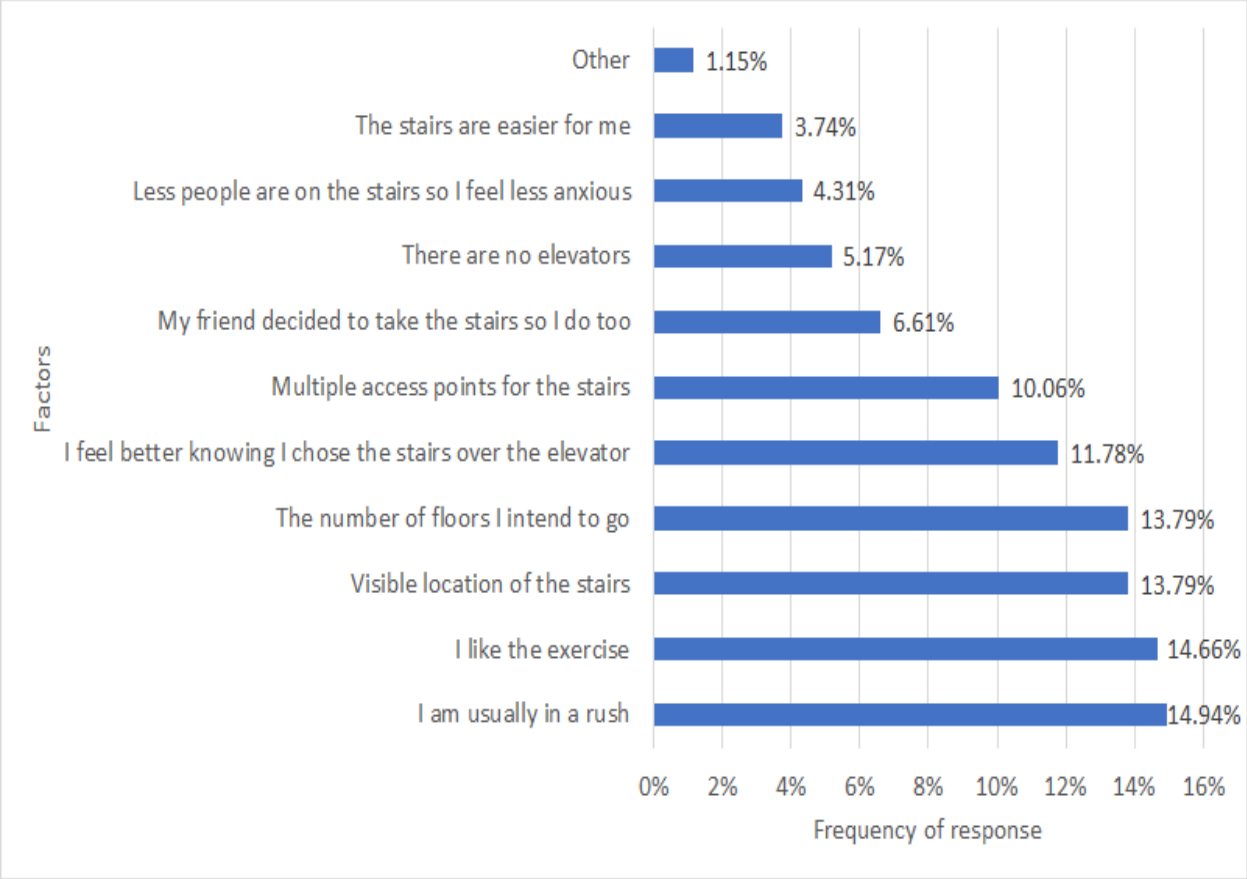




Note. 82 participants access the IKB. 81 participants access the Nest. 34 participants noted they frequently access other buildings.

Figure 2

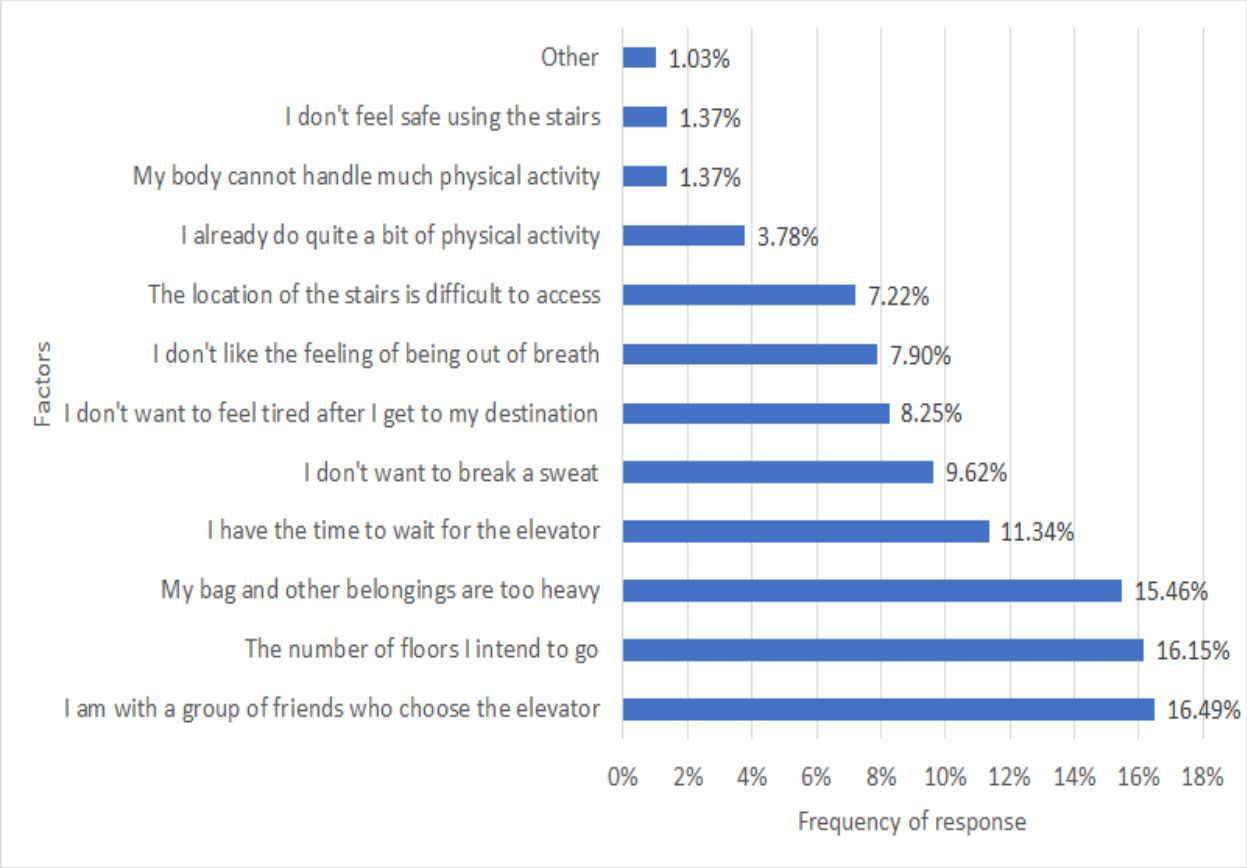
Factors influencing participants to choose stairs over the elevator



Note. Total count of answers submitted was 348 because multiple selections were allowed. "Other" responses included: "scared of the elevators," "elevators make you fat," "wanted to make sure the elevator is accessible for those that need it and can't take the stairs," and "better for [the] planet if I take the stairs."

Figure 3

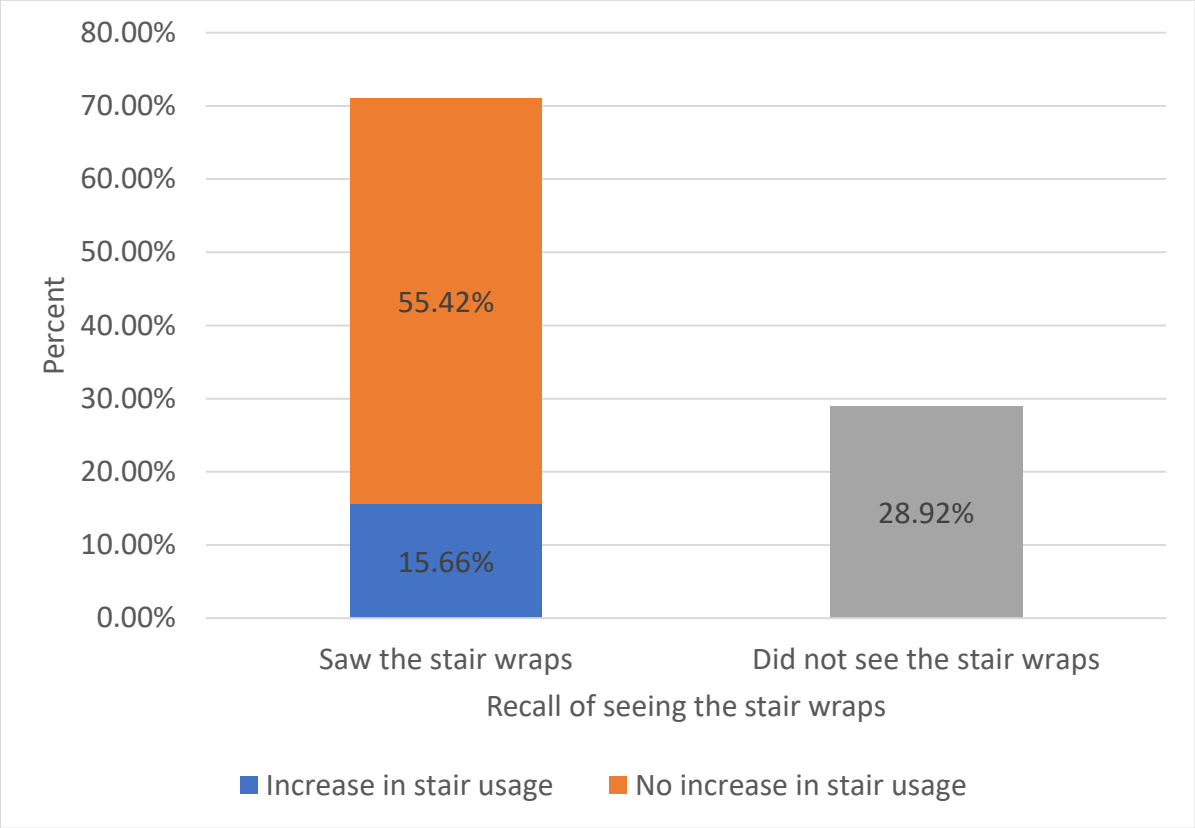
Factors influencing participants to choose the elevator over stairs



Note. Total count of answers submitted was 291 because multiple selections were allowed. "Other" responses included: "I'm going up and down multiple times," "I despise using the elevator," and "never."

Figure 4

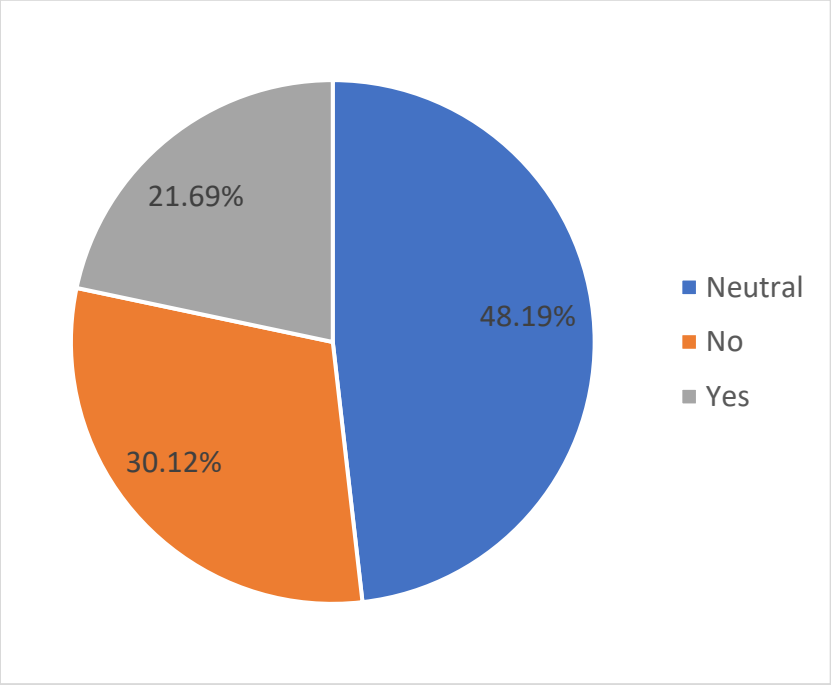
Influence of stair wraps



Note. N=83. The participants who recalled seeing the pre-existing stair wraps inside the Nest or Scarfe building are 71.08% while 28.92% of them recalled seeing neither of the stair wraps. The majority (55.42%) of whom recalled seeing the stair wraps said that the stair wraps did not contribute to increasing their use of the stairs.

Figure 5

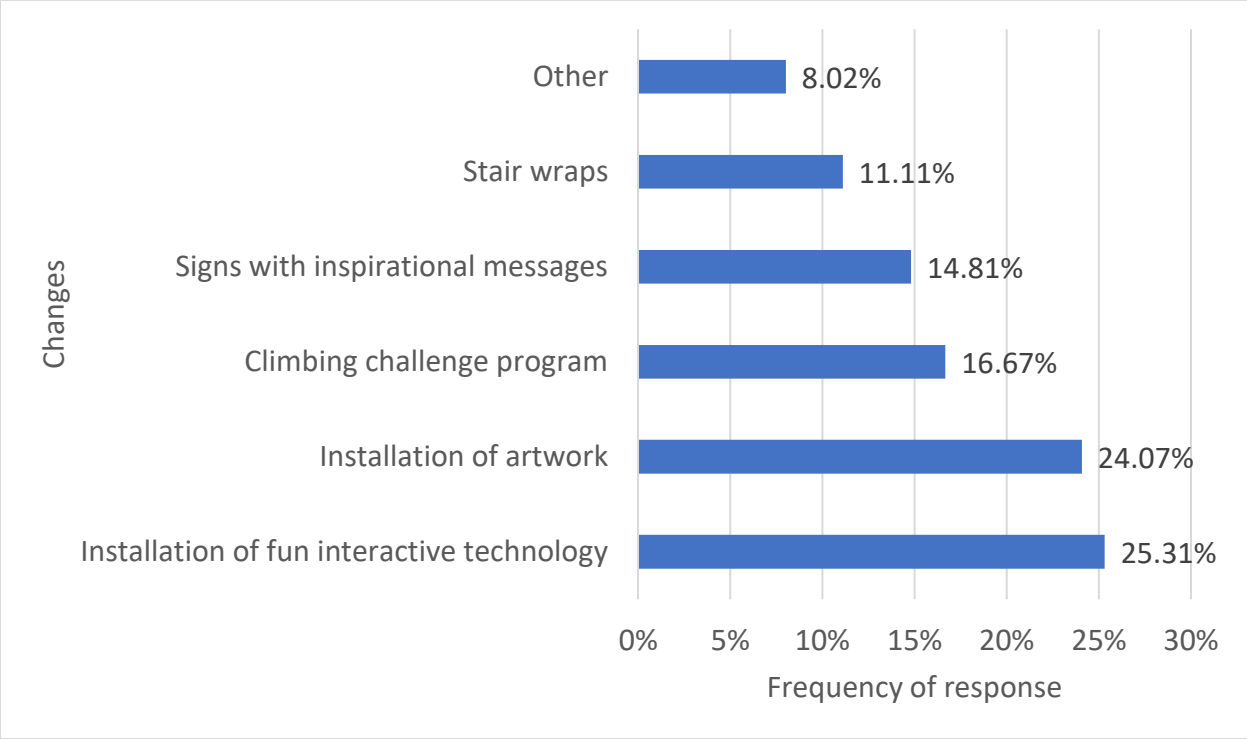
Would stair wraps motivate people to use the stairs



Note. N=83.

Figure 6

What would most motivate participants to use the stairs



Note. Total count of answers submitted was 162 because multiple selections were allowed. "Other" responses included: 8 participants who indicated nothing would increase their motivation to use the stairs; "internal factors," "free food," "lack of elevators," "care bear stairs," and messages about how many calories are burned.