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Changing Behaviour Using Normative Messages:  
Stair-use as an Exemplar

By  
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A Thesis Submitted to  
Saint Mary's University, Halifax, Nova Scotia  
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## Abstract

Jason M. Slaunwhite

### Changing Behaviour Using Normative Messages: Stair-use as an Exemplar

August, 2005

Behaviours such as alcohol use, physical activity and hand washing have important implications for the overall health and well being of individuals. Although health related behaviours have an obvious impact on health and well-being, research suggests that compliance rates are well below acceptable levels. A potential explanation for low adherence rates is the failure of Public Service Announcements (PSAs) to have desired effects in this domain. Traditionally, information campaigns have been used in an attempt to increase the compliance to these aforementioned behaviours. PSAs that use information-based techniques in isolation may be inadvertently decreasing targeted behaviour by neglecting the normative behaviour of the audience of interest. Research conducted using a norm-based approach suggests that societal behaviour can be altered using a descriptive/injunctive framework (Cialdini 2003). The current study investigates the effects of normative messages on stair-climbing behaviour in a university setting. A series of observations and focus groups were utilized in order to evaluate the overall effectiveness of the novel messages derived from the normative behaviour rationale. In addition, an existing Public Health Agency of Canada message was included to measure its effectiveness versus the novel poster conditions. Results suggest that certain messages derived from a norm-based framework are more persuasive when attempting to increase stair-climbing behaviour. Implications and future research are discussed.

## Dedication

This project is dedicated to my family and to the memory of Mary “Ruth” Higgins (Aunt Ru Ru).

## Acknowledgements

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Finally, and most importantly, I would like to thank my parents, Agnes and Murray Slaunwhite. Anytime that I needed anything throughout this journey you have been there for me and I truly appreciated all you have done. I would not have been able to be successful in life without your sacrifices and dedication.

## Table of Contents

Abstract .....	ii
Dedication .....	iii
Acknowledgements.....	iv
List of Tables .....	vii
List of Figures .....	viii
CHAPTER 1: INTRODUCTION.....	1
Compliance Theory.....	5
Theory of Normative Conduct.....	7
<i>Overview of Thesis</i> .....	11
CHAPTER 2: PILOT STUDY.....	13
<i>Overview and Goals</i> .....	13
<i>Session 1</i> .....	13
Method.....	13
<i>Participants</i> .....	13
<i>Materials and Apparatus</i> .....	13
PHAC Messages: .....	13
<i>Results</i> .....	14
Section 1: Focus Groups.....	14
<i>Session 2</i> .....	14
<i>Participants</i> .....	14
<i>Materials and Apparatus</i> .....	15
Posters.....	15
PHAC.....	15
Novel Messages .....	15
<i>Measures</i> .....	17
Pre-testing of Conditions .....	17
Results.....	18
Section 2: Pre-testing of Conditions .....	18
<i>PHAC Messages</i> .....	18
<i>Novel Poster Conditions</i> .....	19
Simple Messages.....	19
Complex Messages .....	21
CHAPTER 3: STUDY 1.....	23
<i>Overview and Goals</i> .....	23
Method .....	25
<i>Design</i> .....	25
<i>Participants</i> .....	27
<i>Results</i> .....	28
Observational Component .....	28
Descriptives.....	28
CHAPTER 4: GENERAL DISCUSSION.....	35
<i>Future Research</i> .....	41
<i>Limitations</i> .....	44
Conclusion .....	46
References.....	47

Appendix A: Experimental Materials .....	50
Informed Consent (Pilot Experimentation).....	50
Pre-testing Measure .....	51
Appendix B: Poster Conditions .....	57
Appendix C: Testing Schedule .....	75
Week 1 .....	75
Week 2 .....	75
Week 3 .....	76
Week 4 .....	76
Week 5 .....	76
Week 6 .....	77

## List of Tables

Table 2-1: Mean ratings of PHAC’s poster conditions when individuals were required to respond to the statement: “To what extent did the poster encourage you to use the stairs?.....	26
Table 3-1: Summary of Logistic Regression Analysis for Variables Predicting Stair Use Behaviour when Compared to a Baseline Condition.....	37
Table 3-2: Summary of Logistic Regression Analysis for Variables Predicting Upward Stair-Use Behaviour when Compared to a Baseline Condition.....	40
Table 3-3: Summary of Logistic Regression Analysis for Variables Predicting Downward Stair-Use Behaviour when Compared to a Baseline Condition.....	41

List of Figures

Figure 3-1: Percentage of stair-use within various poster conditions .....36

Figure 3-2: Frequency of stair-use for each directional condition.....39

## CHAPTER 1: INTRODUCTION

According to the Canadian Institute for Health Information's (CIHI) 2004 report, more than half of all Canadians are considered sedentary. This prevalence of inactivity has led to increased levels of cardiovascular illness, premature death, mental ill-health and even financial strains on the Nation's health care system. In their 2000 study, Katzmarzyk, Gledhill, and Shephard estimated that approximately \$2.1 billion dollars (2.5% of the total health care costs in Canada) were directly attributable to physical inactivity in the year of 1999. In addition, Katzmarzyk et al. (2000) suggest that 21 000 lives were lost prematurely due to sedentary behaviour in 1995. Across Canada this trend has been fairly consistent; however the Atlantic Provinces are considered to have the highest incidence of illness associated with obesity. Numerous levels of government, policy makers, and researchers have debated the reasons for this disparity; however the data continue to report some very alarming trends in this region. For example, the latest figures suggest that over 55% of Nova Scotians get less than 15 minutes of physical activity per day and that physical inactivity costs the province of Nova Scotia an average of \$107 million dollars per year in medical care costs (Nova Scotia Health Promotion, 2005). Based on these data it is clear that obesity presents a serious issue for the health and well-being of many individuals and places a strain on health care funding.

One of the most effective ways to reduce Body Mass Index (BMI) and subsequently reduce obesity is to be physically active. Exercise can occur in variety of different forms, including, but not limited to, running, walking, weight-resistance training, and swimming. One particular method that is not mentioned as frequently is

the process of stair-climbing. Stair-climbing is an effective, low cost way to increase overall levels of physical activity, lose unwanted pounds (Brownell, Stunkard, & Albaum, 1980), improve good cholesterol (HDL) (Boreham, Wallace & Nevill 2000), and reduce the risks associated with falls in the elderly population (Allied Dunbar Survey, 1992). The aforementioned benefits of using the stairs have prompted the Public Health Agency of Canada (PHAC), among others (e.g., Centre's for Disease Control), to offer stair-climbing programs that attempt to encourage employees to utilize the stairs instead of the elevator at their place of employment. According to the PHAC, there are numerous benefits associated with stair-climbing at work. Increased weight loss, lowered risk of cardiovascular disease and premature death, arriving to destinations on time, and more productive employees, are just some of the benefits the PHAC include on their "Stairway to Health" website as being positive outcomes of implementing a stair-climbing initiative in workplaces (<http://www.phac-aspc.gc.ca/sth-evs/english/>).

Although stair-use has been identified as both a cost-effective and appropriate way to target inactivity there have been few studies investigating the impact of interventions directed toward increasing this behaviour. For the most part, the research that has been reported in the stair-use literature involves the use of poster prompts to increase the use of stairways. In their 2002 meta-analysis Kahn, Ramsey, Brownson, Heath, Howze et al. identified only six reported studies that evaluated the effectiveness of point-of-decision prompts on stair-use between 1980 and 2000. Point-of-decision prompts are poster messages that inform individuals of the positive effects of using the stairs, or conversely the ill effects of not using the stairs.

Although this disparity in research still exists, there have been steps toward understanding the impact of poster prompts on increasing stair-use behaviour.

One of the earliest attempts at investigating the impact of point-of-decision prompts on stair use was conducted by Brownell, et al. (1980). This research was conducted at train stations and bus terminals within the city of Philadelphia and concluded that point of decision prompts were responsible for a significant increase in stair use among the 45 694 commuters observed. A similar result was obtained in 1998 when Andersen, Franckowiak, Snyder, Bartlett and Fontaine observed the impact of point of decision prompts on patrons within a large shopping mall in Baltimore, Maryland. Andersen et al; used two distinct messages aimed at increasing stair use among the shoppers. One message involved the health benefits associated with using the stairs instead of the escalator. The authors hypothesized that if individuals viewed a message related directly to improving their overall health they would be more likely to use the stairs rather than the elevator. The second message utilized a weight control message that was designed to increase stair use based on the positive effects associated with weight loss (e.g., improved body image). A total of 17 901 observations revealed a significant increase from 4.8% to 6.9% in stair use behaviour. Although on the surface this may seem to be a miniscule effect, the researchers suggest that even small effects are very important when investigating health related behaviours. For example, the authors argued that even with a 4% increase in stair use at shopping malls in the United States (estimated at 1850 by the International Council of Shopping Centres in 1997), more than 1.6 million Americans

would utilize the stairs over an escalator or elevator each day. This argument has important implications for all research conducted in the area of stair-use behaviour.

Other research conducted within the stair use literature investigated the importance of the physical design or the emotional reactions elicited by the poster message. Boutelle, Jeffery, Murray, and Schmitz (2001) investigated the impact of signs, artwork and music on the use of stairs. Among other findings the authors discovered that the interventions aimed at increasing stair use among University staff were effective. More specifically, a condition adding artwork and music to a poster prompt was more effective at increasing stair use among employees than a poster condition in isolation. However, it is important to note that a poster only condition did have a small significant and positive effect on stair-use. This was an important finding as it supports the rationale of using a point-of-decision prompt in isolation.

Indeed, research investigating the benefits associated with physical activity at work and in public locations indicates that stair climbing is an effective, low cost way to promote healthy behaviours (Brownell, et al. 1980, Andersen et al. 1998, Boutelle et al. 2001). Although the benefits of using the stairs at work are fairly obvious, there is some ambiguity in results when attempting to implement successful interventions that truly alter individual behaviour. Kerr, Eves, and Carroll (2001) used trained observers to investigate the impact of a poster prompt following a two-week baseline period. Kerr et al. used existing poster messages, deemed to be successful in previous studies, in an attempt to change the frequency of stair-use at two public shopping malls. The researchers found conflicting results for the effectiveness of the poster prompts when considering such variables as the direction of stair use (ascending vs.

descending), gender (women used stairs significantly more in one environment, men in the other), and traffic volume in front of the elevator. An interesting finding in this study was the reactions by participants to the messages presented on the poster prompt. The poster that used the message “stay healthy, use the stairs” elicited feelings of guilt and laziness in some of the participants. This was an unexpected finding and does offer some evidence that the rejection of a message may have influenced the overall findings within the study. This is an important consideration for future studies which use poster prompts to influence behaviour.

As seen in the previous research, there has been a substantial effort to understand and alter the attitudes and behaviour of individuals with respect to using the stairs. Moreover, previous research has demonstrated that point-of-decision prompts can alter individual stair-climbing behaviour. Yet, the research conducted thus far has focused on changing the attitudes and behaviour of individuals without consideration of the theoretical research conducted within the attitude and persuasion literature. Poster designs that are attempting to alter individual attitudes and behaviour might be more influential if the designers considered research derived from this sub-discipline of psychology.

### *Compliance Theory*

The absence of attitudes and persuasion research in the design and implementation of Public Service Announcements (PSAs) has been well documented. According to Bator and Cialdini (2000) the majority of PSAs that are created fail to take into consideration certain issues. Admittedly, PSAs and poster messages are not

identical in their design and implementation; however they do have numerous similarities and a common outcome in mind. Poster messages and PSAs attempt to alter individual behaviour by providing pre-selected information to a target audience, therefore it could be argued that a poster prompt is a special type of a PSA.

According to Bator and Cialdini (2000) failure to understand what motivates the target audience is a crucial mistake that many creators of PSAs make. Indeed, there are numerous examples of commercials that are considered admirable, but fail to alter the behaviour of interest. For instance, Bator and Cialdini use popular examples of award winning commercials that are surprisingly ineffective when attempting to alter behaviour.

One of the most famous examples of an award winning PSA not having a desired effect is the “Iron Eyes Cody” spot broadcasted in the 1970s and 1980s. This commercial was created to reduce the prevalence of littering behaviour in the United States. The creators of this PSA presented viewers with an image of a Native American canoeing up a river littered with industrial and individual waste. Near the end of the commercial the Native American watches as a passing automobile tosses trash into a heavily polluted section on the riverbank. As the camera angle changes to focus back on the Native American, a tear flows down his face. The commercial ends with the message: “People Start Pollution, People Can Stop It” (Cialdini, 2003). The problem with this television spot, according to Cialdini, is that it is presenting the audience with information that suggests littering is a common behaviour that they should not participate in. The overabundance of litter floating down the river and scattered along the riverbank suggests that littering occurs on a regular basis but you

should not participate in this behaviour. Within the compliance literature describing what is normal or typical behaviour is referred to as a descriptive norm (this point will be elaborated on shortly). As seen in the “Iron Eyes Cody” spot, the descriptive component of the commercial is in stark contrast to the social consequences of what is considered the “right thing to do”. Although the creators of this commercial spot did have the proper intentions in mind they most likely failed to motivate the target audience to stop polluting. In order to motivate the audience of interest it is important for the creators of PSAs to consider how social norms affect behaviour.

### *Theory of Normative Conduct*

One area that is receiving increased attention within the attitude change literature is the Focus Theory of Normative Conduct (Cialdini, Reno, & Kallgren, 1990), which purports that individuals are persuaded based on two distinct, but compelling norms, descriptive and injunctive.

*Descriptive norms* describe what is typical or normal, or what most people do. Descriptive norms motivate by providing evidence as to what will likely be an effective and adaptive action. According to Cialdini, if an individual believes that most people are acting in a certain way they will act accordingly. This is even true when the attitude toward certain behaviour is “morally neutral” (e.g., choosing consumer products, looking up at the sky). In the “Iron Eyes Cody” spot previously mentioned the descriptive norm would be suggested by the amount of litter present along the riverbank. If there is an overabundance of litter present it suggests that littering occurs on a regular basis. The perceived frequency of littering may lead one to conclude that littering is a typical or normal behaviour.

*Injunctive norms* refer to the rules and beliefs of what qualifies as morally appropriate behaviour. Instead of focusing on what “is done”, injunctive norms focus on what “ought to be done”. In addition, injunctive norms motivate by providing social rewards and punishments (Cialdini et al., 1990). Referring back to the “Iron Eyes Cody” spot the injunctive norm would be the message at the end of the commercial that requests viewers to stop littering. The act of littering is a socially undesirable behaviour that harms the environment and creates unpleasant conditions (e.g., odours, health hazards, etc.) for other members of society.

Cialdini and colleagues have shown that individual behaviour can be influenced by the aforementioned social norms. Cialdini et al. (1990) used five separate studies to investigate the role of descriptive and injunctive norms on individual behaviours within a variety of natural settings. The first three studies within this research attempted to manipulate littering behaviour by having litter present or absent. The researchers hypothesized that if individuals were presented with an environment that has heavily littered it would activate the descriptive norm and individuals would be more likely to litter. Conversely, if individuals were presented with an environment that was not littered, they would be less likely to litter. In addition, each condition had a confederate visually present who participated in littering behaviour. The results of the first three studies suggested that behaviour was influenced when the target behaviour (littering) was portrayed as typical (e.g., littering was higher in conditions where there was an abundance of litter). However, the authors were unable to determine whether or not the pieces of litter (handbills) were also activating the injunctive norm (e.g., a single piece of litter may have

reminded subjects of the societal objection to litter). Based on this rationale the authors created conditions where each norm would be presented. The “mixed message” in this study used a descriptive norm cue (abundant litter) inclined toward littering, and an injunctive norm cue (swept litter) inclined against littering. In order to draw attention to each of the environmental conditions a confederate either dropped a handbill to draw attention to the littered or un-littered environment or walked by without littering. When a dropped handbill drew attention to the “clear descriptive norm favouring littering” (un-swept litter), littering increased from 33% in the condition where the confederate did not litter (low norm-salience) to 45% in the condition where the confederate littered (high norm-salience).

When this same procedure was used with the conflicting injunctive norm (swept litter) the results were reversed to suggest that 29% of participants littered when the confederate did not litter and that only 18% of participants littered when the confederate littered. The authors concluded that both descriptive and injunctive norms were effective at eliciting behaviour change and may be used to alter other undesirable behaviours (e.g., drinking & driving, smoking etc.) by focusing individuals on social norms.

The final study used the process of spreading activation<sup>1</sup> to focus subjects differently only on the injunctive norm of anti-littering. The authors hypothesized that subjects would litter less in the condition that was identical to the injunctive norm, more in the condition that was close to the injunctive norm, and most in the condition that was most unlike the injunctive norm. The subjects were presented with handbills

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<sup>1</sup> This theory suggests concepts are linked together in memory within a network of nodes and that activation of one concept results in the spreading of the activation along the network to other related concepts.

similar to the other studies; however each handbill presented a different message that was either identical to the injunctive norm (anti-littering), close to the injunctive norm (energy conservation), or distant from the injunctive norm (voting). Results of this study supported the researcher's initial hypotheses that focusing the subject's attention to the injunctive norm would increase the desired outcome of not littering. The results of this study should be considered when designing messages aimed at altering human behaviour. Specifically, it is important to create messages that support the injunctive norm (assuming that you are using an injunctive norm) when attempting to manipulate behaviour.

Although injunctive and descriptive norms have been successful at changing a variety of behaviours, there are circumstances when an injunctive norm would be preferred to a descriptive norm. Cialdini (2003) suggests that a descriptive norm may be detrimental in situations where the undesired behaviour is prevalent. According to Cialdini et al., this is often the case when individuals attempt to design PSAs targeting recycling behaviour. If the PSA is describing the majority of a population as participating in an undesired behaviour (littering), the audience will be less motivated to change their behaviour. In fact, previous research has shown that campaigns based on this rationale would have the reverse effect; an increase in littering behaviour (e.g., Iron Eyes Cody). Acknowledging that a descriptive message would be ill-fated in situations where the undesired behaviour is prevalent, a descriptive message can be used with confidence when the desired behaviour is most prevalent (Cialdini et al. 2003).

For example, if the majority of a population of interest were not littering it would make sense to focus the audience on the descriptive normative behaviour. Again, the importance of the target audience is critical here in order to make this distinction. This is an important consideration when designing PSAs that purport to target health-related behaviours. Descriptive normative messages designed to targeted stair-use should explain that the majority of the population of interest are using the stairs on a regular basis if stair-use is indeed the prevalent behaviour. If the majority of the population were not using the stairs regularly, use of a descriptive normative message would be ill-advised.

#### *Overview of Thesis*

Previous research conducted on recycling trends discovered that messages using an injunctive/descriptive framework were successful at altering social behaviour in a variety of contexts (Cialdini, Reno, & Kallgren, 1990). Although Cialdini's framework has not been used to influence stair-use behaviour it does seem logical to investigate the possibility of norms influencing the prevalence of stair-use. The PHAC purports to be changing normative behaviour using existing messages that are not derived from a norm-based framework. Posters that offer only information-based messages do not explain what is considered normative behaviour (e.g., what are the majority of employees doing?). If posters did exist, based on Cialdini's framework, it would seem likely that an increase in stair-use would be possible above and beyond current initiatives. Based on this rationale this thesis will explore the possibility that health-related behaviours could be influenced by social norms. In order to test this assumption, norm-based conditions were created that represent a

variety of different theoretical perspectives derived from Cialdini's works. Four conditions including two simple (injunctive and descriptive) and two complex (Injunctive/Descriptive consistent and Injunctive/Descriptive inconsistent) were created. The norm-based posters were then used in conjunction with existing PHAC messages in order to determine if significant differences existed between the various conditions when attempting to increase stair-use behaviour above a baseline measurement.

## CHAPTER 2: PILOT STUDY

### *Overview and Goals*

The pilot study consisted of two sessions that were designed to evaluate various dimensions of the poster conditions. First, it was important to determine which PHAC messages would be utilized in this study. To achieve this goal the first section of the pilot study was used to rank-order the 14 PHAC messages via focus groups. The rationale of using a focus group format was to highlight which of the 14 existing PHAC messages were most effective at promoting stair-use.

The second section of the pilot experimentation was used to determine the appropriateness of the various poster messages within Cialdini's framework. In order to achieve this goal a series of evaluations were conducted on the top ranked PHAC messages and the novel poster conditions using a pre-testing questionnaire.

### *Session 1*

#### *Method*

##### *Participants*

Participants included ten faculty members and graduate students (N = 10) within the Psychology department at Saint Mary's University. No demographic data was collected within this portion of the research study. In addition there was no compensation for participation.

##### *Materials and Apparatus*

##### *PHAC Messages:*

The messages that were used in this study involved 14 existing 1 page (8½ x 11) posters designed by the Centres for Disease Control (CDC) adapted for use in Canada by the PHAC. This poster package is available on the PHAC's website (<http://www.phac-aspc.gc.ca/sth-evs/english/>) and is intended for organizations that

are interested in changing the normative behaviour of their employees. In order to determine which PHAC posters would be used in the pre-testing phase a card-sorting task was performed. Participants were required to rank order the 14 messages from best to worst when considering how effective the messages were at promoting stair-use. Based on this activity the five highest rated PHAC posters would be included in the pre-testing phase (session 2).

## *Results*

### *Section 1: Focus Groups*

The card sorting task identified: (1) ‘when you go up your blood pressure goes down’, (2) “walking up stairs burns almost 5 times more calories than taking the elevator”, (3) “small steps make big differences”, (4) “raise your fitness level, one step at a time”, and (5) “step up to a healthier lifestyle” (See Appendix A) as being the most influential on stair-use behaviour. Following the identification of the top five posters a second session was conducted in order to evaluate the effectiveness of the PHAC posters.

### *Session 2 Participants*

Participants included 98 undergraduate students (62 females and 36 males) with ages ranging from 18 to 29 ( $M = 20.97$ ) and years of study ranging from 1 to 5 years ( $M = 2.56$ ). For participation in this portion of research all participants received compensation in the form of one bonus point to be credited toward a psychology course of their choosing. All participants were required to complete an informed

consent application prior to participation in the research. A copy of the informed consent protocol is in Appendix A of this document.

### *Materials and Apparatus*

#### *Posters*

##### *PHAC*

The five PHAC messages identified as effective in session 1 will be used within the pre-testing phase.

##### *Novel Messages*

In addition to the existing poster messages, a series of distinct poster prompts were created to assess their overall effectiveness. Using Cialdini et al's (1990) Focus Theory of Normative Conduct framework, four separate poster messages were created. Each poster represented a different theoretical condition that involved a descriptive message, an injunctive message, and two mixed model messages (injunctive and descriptive). In order to maintain consistency throughout poster conditions, all posters used identical amounts of information, physical size, and colour contrasts to eliminate the possibility of confounds within the poster design phase.

*Simple Messages:* For the purposes of this study, the descriptive and injunctive conditions were considered simple messages and included a brief statement that would reflect either a descriptive or injunctive message within Cialdini's framework. Based on this assumption, the descriptive condition that was created for use in this study included the following: "The majority of people at SMU use the stairs!" According to Cialdini a descriptive message motivates by providing the individual

with evidence of what is normal or typical behaviour. This message was created based on this rationale. Additionally, the poster presented individuals with an image of a person participating in the target behaviour.

The injunctive message was also created based on Cialdini's framework. When considering the logic behind an injunctive argument or message, Cialdini considers factors such as what society deems appropriate or what an individual ought to do. Based on this rationale the injunctive message included for use in this study was "Don't be lazy, take the stairs!" Within this condition, individuals were presented with an image of a thumb pointing downward to suggest disapproval. Both of the simple messages can be located in Appendix B of this document.

*Complex Messages:* The creation of the complex (also referred to as mixed) messages used a combination of descriptive and injunctive messages that were either in agreement (consistent) or in conflict (inconsistent) with one another. For example, the Injunctive/Descriptive (I/D) consistent message "Most people at SMU use the stairs, don't be lazy take the stairs!" presented a statement that attempted to motivate individuals in the study by describing how the majority of the norm group behaved and how the individuals should behave. It is fairly clear how the descriptive component is being supported by the injunctive aspect of the message. Also, the I/D consistent message presented individuals with images that suggested approval with the act of stair climbing. More specifically, the I/D consistent message had an image of a thumb pointing upward to suggest approval and the identical image presented in the simple descriptive message (e.g., a person walking up the stairs) (See Appendix B).

In contrast, the Injunctive/Descriptive inconsistent message presented a statement that had contradictory information. The descriptive component of the message was in conflict with the injunctive element. For example, the message “Too many people at SMU use the elevator! Don’t be lazy take the stairs!” is suggesting that the norm group is behaving in a way that is socially inappropriate. This rationale is based loosely on the commercial spot “Iron Eyes Cody” mentioned earlier. Additionally, the message included an image of a thumb pointing downwards as to suggest disapproval with using the elevator and an image of a person riding an elevator with a large red circle and slash through the image to infer not using the device. The I/D Inconsistent poster can be located in Appendix B of this document.

The rationale for using the mixed content messages was to investigate what impact the combination of injunctive and descriptive messages would have on stair-use behaviour. This logic was based on Cialdini et al., (1990) research which did use a mixed message in their fourth study. Although the mixed message in Cialdini et al., (1990) study used a mixed message that was inconsistent; they did not use a mixed message that was consistent in its design. This study will be the first to investigate the influence of an I/D consistent message on altering human behaviour.

### *Measures*

#### *Pre-testing of Conditions*

Following the creation of the novel poster messages and the rating of the PHAC’s messages, individuals were required to complete a pre-testing questionnaire that was developed for use in this study. Questions within the pre-testing questionnaire are designed to determine whether or not an argument or statement has

injunctive or descriptive qualities. In addition, this survey measured frequency of the outcome behaviour (stair-use). A copy of the pre-testing questionnaire can be located in Appendix A of this document.

## Results

### *Section 2: Pre-testing of Conditions*

#### *PHAC Messages*

Following the identification of the aforementioned poster conditions a series of evaluations were conducted on a larger sample to identify the highest rated poster condition for use in the study. A total of fifty-three ( $N = 53$ ) individuals participated in the rating of the five PHAC messages. Results suggest that the poster condition “Walking up stairs burns almost 5 times more calories than riding an elevator” would be the most effective at encouraging the individuals in this portion of the research to use the stairs. When individuals were required to respond to the statement “To what extent did the poster encourage you to use the stairs?” a mean rating of  $M = 6.11$  ( $1 =$  not at all,  $7 =$  definitely) was achieved. Although a univariate analysis of variance was performed yielding a non-significant result, an obvious trend was identified when simply viewing the means of the five PHAC posters. Table 2-1 reports the overall mean scores from the various PHAC posters as rated by the second focus group.

*Table 2-1: Mean ratings of the PHAC’s poster conditions when individuals were required to respond to the statement: “To what extent did the poster encourage you to use the stairs?”*

Condition	N	M
When you go up your blood pressure goes down	12	4.92
Walking up stairs burns almost 5 times more calories than taking the elevator	9	6.11
Small steps make big differences	11	4.82
Raise your fitness level, one step at a time	11	5.45
Step up to a healthier lifestyle	10	5.50

### *Novel Poster Conditions*

A sample size of forty-four ( $N = 44$ ) individuals was used to determine the overall appropriateness of the messages within Cialdini's framework. Individuals were required to respond to a series of statements that would ensure the novel messages were in fact presenting one of the four conditions (Descriptive, Injunctive, Injunctive/Descriptive consistent, or Injunctive/Descriptive inconsistent). An example of a statement that was used as a manipulation check for the descriptive poster message was "To what extent did the poster describe that using the stairs excessively was something your peer group is likely to do?" Responses ranged from 1 (not at all likely) to 7 (very likely) on a likert style scale.

### *Simple Messages*

*Descriptive Poster Condition.* Results suggest that the descriptive poster condition (Most people at SMU take the stairs!) adequately represented a descriptive condition within Cialdini's framework. More specifically, the descriptive message had a mean score of  $M = 6.0$  (1 = not at all common, 7 = very common) when individuals were required to answer the statement: "To what extent did the poster describe that using the stairs is a common occurrence?" In addition, it was clear that the poster conditions differed on this item when an omnibus ANOVA was performed. When considering all four novel conditions, a significant result  $F(3, 42) = 11.9, p < .001$  was obtained. Specifically, a Tukey's post-hoc analysis revealed a significant difference between the descriptive and injunctive conditions ( $p = .05$ ). Additionally, there was a significant difference between the descriptive and I/D inconsistent messages. There was no significant difference between the descriptive and I/D consistent message.

When individuals were presented with the statement “To what extent did the poster describe that using the stairs excessively was something your peer group is likely to do?” a mean rating of  $M = 6.0$  (1 = not at all likely, 7 = very likely) was obtained. Upon further investigation it was revealed that the poster messages differed significantly on this item. More specifically, a one-way ANOVA yielded a significant result  $F(3, 43) = 8.56, p < .001$ . A Tukey’s post-hoc analysis indicated that the descriptive message differed significantly from the injunctive and I/D inconsistent messages ( $p = .05$ ). There was no significant difference between the descriptive message and the I/D consistent message.

*Injunctive Poster Condition.* When considering the injunctive poster condition (Don’t be lazy, take the stairs!), results suggest that this condition adequately represented an injunctive message within Cialdini’s framework. More specifically, the injunctive poster had a mean rating of  $M = 5.6$  (1 = inappropriate, 7 = very appropriate) when individuals were asked: “To what extent did the poster describe that using the stairs excessively is an appropriate way to behave?” When the same statement was reversed to the negative form: “To what extent did the poster describe that using the stairs excessively is an inappropriate way to behave?” the mean was reduced as expected ( $M = 2.90$ ). Although the injunctive conditions produced specific trends when comparing mean averages there was a non-significant result when performing an omnibus ANOVA on the injunctive statement “To what extent did the poster describe that using the stairs excessively is an appropriate way to behave?”  $F(3, 43) = 1.36, p = .26$ . However, a significant result was obtained when analysing this statement in its negative form. When participants were required to respond to the statement “To what

extent did the poster describe that using the stairs excessively is an inappropriate way to behave?" a significant omnibus ANOVA was produced  $F(3, 43) = 3.51, p < .05$ . A Tukey's post-hoc analysis revealed a significant difference between the descriptive and I/D inconsistent conditions ( $p = .05$ ).

### *Complex Messages*

When pre-testing the Injunctive/Descriptive consistent and Injunctive /Descriptive inconsistent messages the results should be treated with caution. Since there was no existing measure available to pre-test the complex messages, a series of analyses similar to those conducted on the simple messages were performed. After comparing the various conditions it was evident that the complex messages were in alignment with Cialdini's taxonomy. For instance, when individuals were required to respond to the statement "To what extent did the poster describe that using the stairs is a common occurrence" on a seven point likert scale (1= not at all common, 7 = very common), a clear trend emerged between the descriptive and I/D consistent messages. The overall mean response to this item when individuals were presented with the I/D consistent message was  $M = 5.58$ , as mentioned previously, the descriptive message had a mean score of  $M = 6.0$ . As seen here the descriptive and I/D consistent messages had a trend toward the higher end of the continuum. Conversely, when individuals were required to respond to this same statement "To what extent did the poster describe that using the stairs is a common occurrence" in the I/D inconsistent condition, the overall mean rating was reduced to  $M = 2.50$ . As mentioned previously, a significant omnibus ANOVA  $F(3, 42) = 11.9, p < .001$ , suggested differences in the four poster conditions on this item. A Tukey's post-hoc

analysis identified significant differences between the *I/D* consistent and the injunctive poster conditions and between the *I/D* inconsistent and descriptive poster conditions ( $p = .05$ ). Overall, results from the pre-testing of the novel poster conditions suggest that all conditions fit appropriately into the theory of normative conduct framework.

## CHAPTER 3: STUDY 1

### *Overview and Goals*

The goals of this experiment were to assess the overall effectiveness of the various health-related messages, identified in the pilot study, on stair use behaviour at Saint Mary's University. In order to achieve this goal a number of hypotheses were tested.

First, the PHAC purports to be altering the normative behaviour of individuals using an information-based technique. Previous research conducted within the normative conduct literature suggests that this reality is highly unlikely. For example, the messages the PHAC is utilizing to promote stair-use do not describe what proportion of the target audience is currently participating in the target behaviour (stair-use) or the social consequences of not using the stairs. Simply providing the target audience with the benefits of using the stairs may not be enough to motivate the target audience to use the stairs on a regular basis. Based on this rationale, the following four hypotheses are proposed:

H<sub>1</sub>: Stair-use will not be significantly higher than baseline in conditions where the PHAC poster is present.

H<sub>2</sub>. Stair-use will be significantly higher than baseline in conditions where the descriptive poster is present.

H<sub>3</sub>. Stair-use will be significantly higher than baseline in conditions where the injunctive poster is present.

H<sub>4</sub>. Stair-use will be significantly higher than baseline in conditions where the injunctive/descriptive poster is present.

Second, previous research conducted within the compliance literature suggests that many commercial advertisements and PSAs fail because they present the target audience with conflicting normative information (as discussed in the “Iron Eyes Cody” spot). Based on this assumption the following hypothesis is proposed:

H<sub>5</sub>. Stair-use will not be significantly higher than baseline in conditions where the injunctive/descriptive inconsistent poster is present.

Third, previous research conducted using norm-based frameworks (Cialdini et al., 2003) has indicated that a descriptive message may be more influential when the desired behaviour is prevalent. Information obtained during the pilot phase of this research project suggested that stair use is a fairly common behaviour among the population of interest. More specifically, the pre-testing phase of this research identified 88.9% of participants as using the stairs “often” to “always”. Based on this logic, the following hypothesis was proposed:

H<sub>6</sub>. The descriptive message will be more effective than the injunctive messages at increasing stair use.

Finally, although there are no existing research studies using mixed content messages, it does seem probable that the consistent message would motivate above an inconsistent message. In the consistent form individuals are provided with information that is supporting in nature and not contradictory. As seen in the “Iron Eyes Cody” spot previously mentioned, individual behaviour was not impacted when an inconsistent message was presented. Moreover, since the desired behaviour (stair-use) is considered to be prevalent in this population it does not seem likely that an

inconsistent message would be successful at increasing the desired behaviour. Based on the aforementioned, the following hypothesis is proposed:

H<sub>7</sub>. The mixed content consistent message (I/D consistent) will be more effective than the mixed content inconsistent (I/D inconsistent) message at increasing stair use.

## Method

### *Design*

For the purposes of this study, stair-use was analyzed in one of the most frequented buildings at Saint Mary's University, the McNally building. This building was selected based on traffic volume and the fact that it possesses elevators<sup>2</sup> and stairways that are in close proximity to one another. Six locations within the McNally building were selected which included three “up” locations and three “down” locations. The “up” locations were comprised of the basement floor of McNally North wing, the basement floor of McNally Main wing, and the basement floor of McNally South wing. Within these conditions the only possible direction of stair-use traffic was upward. The “down” locations included the fifth floor of McNally North wing, the third floor McNally Main wing and the fourth floor of McNally South wing. Within these three conditions the only possible direction for stair traffic was downward.

Data was collected using an observational design that required research assistants to tabulate stair/elevator traffic during a six-week period. Research assistants were provided with a checklist that made tabulation of pedestrian traffic

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<sup>2</sup> The elevators used in this study were quite dated and not as rapid as elevators available in modern buildings. It is important to note that all of the experimental locations in this study used elevators with the identical design and that any possible issues with the elevator's appearance were present in all locations.

simplistic (See Appendix B). All observers were trained so that the observations would remain consistent throughout the study. Prior to any data collection a pilot week was conducted in order to highlight any potential issues with the design of the observation checklist or to underline other situations that were not anticipated. The pilot week did bring to light a few concerns, specifically it was decided that no individuals familiar with the project would be included in the observation phase. Individuals included in this segment were essentially staff and faculty members within the Psychology department at Saint Mary's University. Additionally, no persons carrying objects appearing larger than 1ft x 2ft, or pushing carrying carts were included within the study. This precaution was taken based on previous research conducted in the stair use literature<sup>3</sup>. Finally, physically disabled members of the Saint Mary's community were not included within the observational component of this study. This decision was made based on the inability of physically disabled persons to use the stairs and the lack of ramps that would allow complete access to all floors<sup>4</sup>.

In order to assess what percentages of students and staff currently utilize the stairs, a baseline measure was required prior to any data collection. Based on this rationale, the first two weeks of observations were treated as a baseline measure with no poster prompts present. Pedestrian traffic was measured on select days of the week in addition to specific times during each day. Following the baseline measure, poster conditions were randomly assigned to one of the remaining 4 weeks. In order to

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<sup>3</sup> Individuals carrying items larger than a briefcase or pushing carts were not included in Boutelle et al. (2001) research study that was conducted in a University setting.

<sup>4</sup> Individuals in a wheel chair would not be able to use a ramp to move from the basement floor to the first floor as no ramps are in existence.

control for specific day or time effects, all data collection was conducted at precisely the same time and day in each condition. For a more detailed explanation of the observation schedule please refer to Appendix B of this document.

*Classification Consistency:* In order to determine the reliability between observers a series of reliability checks were conducted. This assessment was conducted in order to highlight the potential subjective biases in the observation component of the research project. The inter-rater agreement was calculated by having the lead researcher collect observational data in tandem with each observer in the study. Following data collection the two data entry forms were compared/contrasted in order to highlight the percentage of agreement between observers. The seven members of the observation team had an average inter-rater agreement of 92.3%<sup>5</sup>.

### *Participants*

Participants included 3339 members of the Saint Mary's University community. Both genders were evenly represented with a total of 1764 female and 1575 males observed using the various stairway conditions. Since this was an observational design there was no informed consent required within the data collection phase of this study.<sup>6</sup>

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<sup>5</sup> According to Smith and Davis (2001) an inter-observer agreement of 85% is the minimum threshold used by journal editors and reviewers when considering publication submissions.

<sup>6</sup> According to code I.20 of the Canadian Code of Ethics for Psychologists, "it is not necessary to obtain informed consent for research activities that use unobtrusive measures".

## *Results*

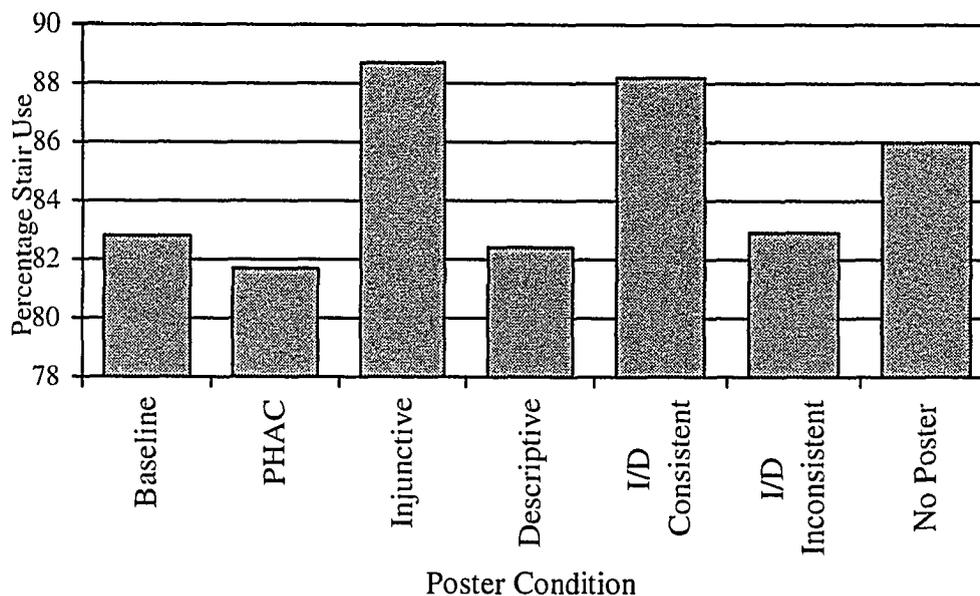
### *Observational Component*

Prior to any data manipulation all data were screened using SPSS version 11.5. Since many assumptions such as the linearity of the relationship between independent variables and the dependent variables, homoscedasticity, and normally distributed variables are not necessary in logistic regression (Tabachnick, & Fidell, 2001) they will not be reported. However, all observations were checked to ensure they were independent of one another, this assumption was satisfied.

### *Descriptives*

A Pearson chi-square analysis suggests significant differences between the 7 poster conditions  $X^2(6) = 16.54, p < .05$ . Figure 3-1 highlights the percentage of stair use observed within each poster condition. As seen here the injunctive (88.7%), I/D consistent (88.2%), I/D inconsistent (82.9%) and no poster condition (86%) had higher levels of stair use than did the baseline measure (82.8%). The descriptive (82.4%), and the PHAC poster (81.7%) suggest a small decrease in frequency of stair-use behaviour.

Figure 3-1: Percentage of stair-use within various poster conditions.



#### Logistic Regression Analysis

A total of 3339 observations were recorded at six locations throughout the McNally building at Saint Mary's University. In order to determine what effects the various conditions (e.g., no poster, heath Canada, descriptive, injunctive, injunctive/descriptive consistent and injunctive/descriptive inconsistent) had on stair-climbing behaviour above a baseline measure (N= 1250), a series of logistic regression analyses were conducted. For the purposes of this study the dichotomous outcome variable of interest was "stair use", yes (coded 1) or no (coded 0) for data analysis. Additionally, the variable "gender" was entered into the first block of the design in order to control for possible gender effects<sup>7</sup>.

<sup>7</sup> This precaution was based on previous research that identified gender effects in stair-climbing behaviour (see Kerr Eves and Carroll; 2001).

Investigating the covariates entered into the logistic regression analysis, results suggest that there are two conditions within the current study that had a significant influence on predicting stair-use behaviour, when compared with the baseline measure. More specifically, the injunctive  $\chi^2(1) = 6.442$ ,  $p < .001$  and I/D consistent  $\chi^2(1) = 8.67$ ,  $p < .001$  messages had a significant impact at promoting stair use within the current research. All other conditions were not found to have significant predictive characteristics of stair use behaviour. Table 3-2 reports the summary results for the logistic regression analysis.

*Table 3-1: Summary of Logistic Regression Analysis for Variables Predicting Stair Use Behaviour when Compared to a Baseline Condition.*

Condition	N	B	SE B	$e^B$	$\chi^2$
No Poster	221	.241	.208	1.27	1.46
PHAC	453	-.076	.143	.926	.307
Injunctive	291	.485*	.199	1.62	6.57*
Descriptive	426	-.029	.148	.972	.051
I/D Consistent	534	.440**	.154	1.55	8.67*
I/D Inconsistent	164	.01	.221	1.01	.039

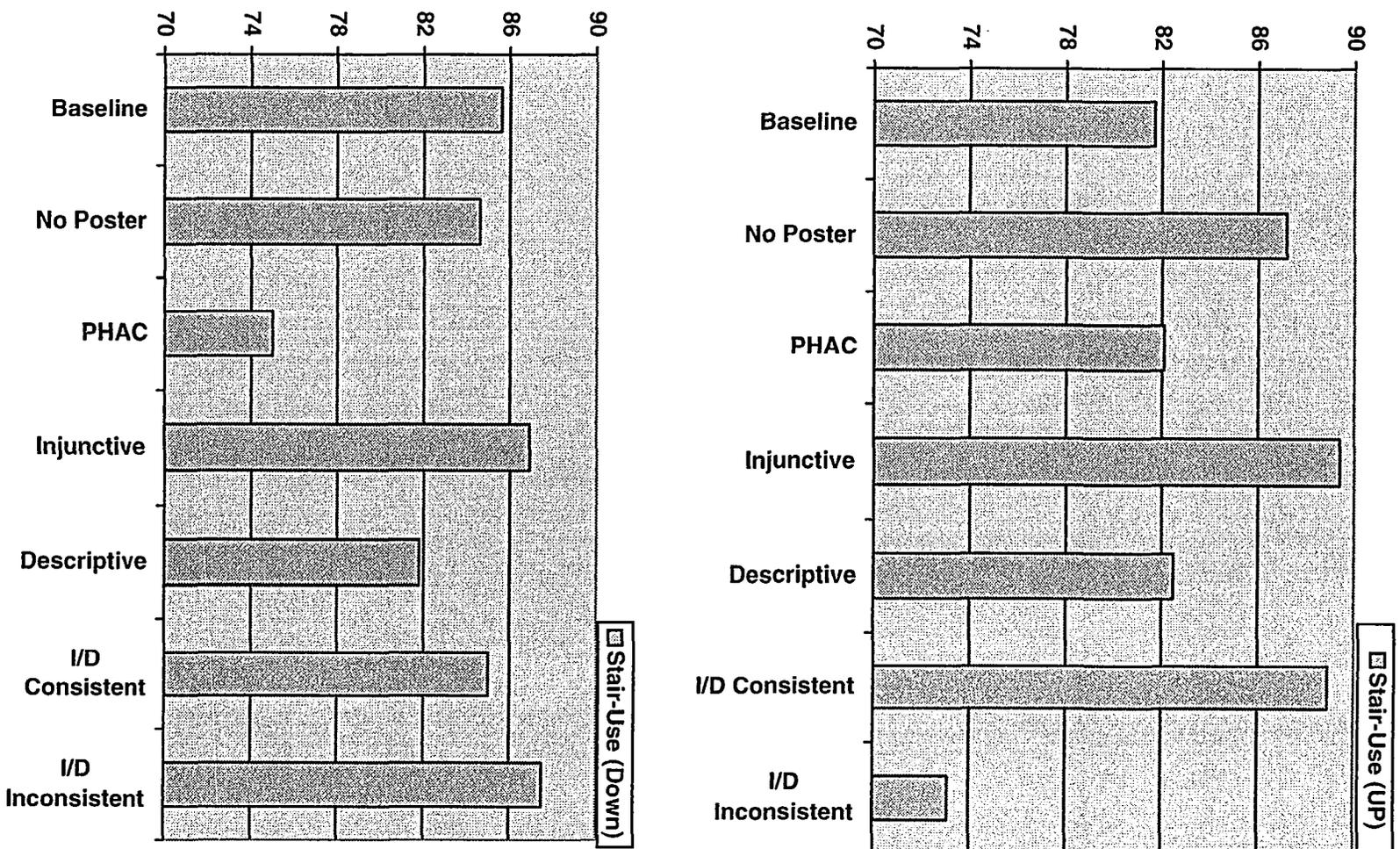
*Note:*  $e^B$  = exponentiated B. Baseline (N) = 1250  
 \* =  $p < .05$ , \*\* =  $p < .01$ .

Although there was no specific hypothesis to investigate the impact of direction, the preliminary results suggest that traffic direction may be inflating the results in the down locations or suppressing the results in the up locations. In order to determine the effectiveness of the poster conditions when only considering upward or

downward stair-use a series of procedures were conducted. First, the data was split to reflect only those observations that were collected in the “up” or “down” locations.

Figure 3-3 indicates the percentage of stair-use within each of the two directional conditions.

Figure 3-2: frequency of stair use for each directional condition.



Second, once the data was dichotomized, a logistic regression analysis including only the “up” conditions (N = 1571) was conducted and produced two conditions that had a significant impact on stair-use behaviour. As seen in the initial logistic regression analysis the injunctive  $\chi^2(1) = 7.69$ ,  $p < .05$  and the I/D consistent  $\chi^2(1) = 12.01$ ,  $p < .001$  messages had a significant impact at promoting stair use.

Table 3-3 reports the summary results for this analysis.

Table 3-2: *Summary of Logistic Regression Analysis for Variables Predicting Upward Stair-Use Behaviour when Compared to a Baseline Condition.*

Condition	N	B	SE B	$e^B$	$\chi^2$
No Poster	117	.419	.290	1.52	2.27
PHAC	401	-.012	.155	.988	.006
Injunctive	207	.631*	.199	1.88	7.69*
Descriptive	360	.053	.163	1.05	.104
I/D Consistent	434	.587**	.176	1.79	12.01**
I/D Inconsistent	52	-.499	.324	.607	2.21

Note:  $e^B$  = exponentiated B. Baseline (N) = 903  
 \* =  $p < .05$ , \*\* =  $p < .001$ .

In order to determine if any of the results were influenced by the “downward” conditions<sup>8</sup> a series of analyses were conducted. First, the data was split to reflect only those observations that were collected in the “down” locations. The rationale for this procedure was to eliminate the possibility that the significant results in the “no

<sup>8</sup> After observing a substantial increase in the no poster condition above the baseline measure a series of analyses were conducted in order to explain this unexpected result. As seen here, there does not appear to be an influence of direction on the “no poster” condition.

poster” condition were based on the over representation of the no poster condition in the down locations (i.e., floors where the only possible stair traffic is downward).

Second, a logistic regression analysis including only the “downward” conditions (N = 518) was conducted in order to highlight if any of the poster conditions had a significant influence on stair-use behaviour. There is no evidence to support the effectiveness of any of the poster conditions when analyzing the “downward” conditions in isolation. Table 3-4 reports the summary results for this analysis.

Table 3-3: *Summary of Logistic Regression Analysis for Variables Predicting Downward Stair-Use Behaviour when Compared to a Baseline Condition.*

Condition	N	B	SE B	$e^B$	$\chi^2$
No Poster	104	-.077	.312	.926	.060
PHAC	52	-.218	.397	.804	.290
Injunctive	84	.111	.358	1.11	.098
Descriptive	66	-.278	.354	.758	.593
I/D Consistent	100	-.047	.319	.954	.022
I/D Inconsistent	112	.164	.324	1.17	.263

Note:  $e^B$  = exponentiated B. Baseline (N) = 347

## CHAPTER 4: GENERAL DISCUSSION

This study was the first of its kind to attempt to understand the influence of normative messages on stair-climbing behaviour. The fact that the normative conditions were identified as being influential on stair-use within this study has important theoretical and practical implications. First, this study was successful at incorporating the theoretical framework (theory of normative conduct) into the design and implementation of health-related messages. This adds much needed research to the area of normative influence. Cialdini and colleagues have been focusing much of their research attention on pro-environmental issues and should be commended on many levels. However, it is also very important to continually build on Cialdini's framework in order to understand the implications of social norms in a variety of different contexts. As hypothesised, the results of this study do suggest that stair-use increased significantly above a baseline measure when specific novel poster conditions were present. Specifically, the injunctive and I/D consistent messages were found to predict stair-use above the baseline measurement (Hypotheses 3 and 4 supported). The possibility of incorporating the theory of normative conduct into the design of future interventions targeting health promotion is an exciting prospect. Prior to this study there was no available research to suggest that researchers have attempted to alter health-related behaviour using normative messages.

The fact that this study identified an injunctive condition as the most influential on stair-use behaviour seems somewhat contrary to previous findings within the pro-environmental research. As hypothesised, the injunctive condition was successful at promoting stair-use (Hypothesis 3 supported); however the injunctive

message was also found to predict stair-use above the descriptive poster condition (Hypothesis 6 not supported). Cialdini et al. (2003) consider a descriptive message to be more effective than an injunctive message when the behaviour of interest is prevalent. In this study using the stairs instead of an elevator was identified as the prevalent behaviour; however the descriptive message was not found to be as effective at increasing the use of stairs (Hypothesis 2 not supported). This result is quite intriguing and may be explained in a variety of different ways.

First, it is possible that health related behaviours and pro-environmental behaviours are predisposed to different normative influences. This possibility seems likely, as the two behaviours are very different in a variety of ways. For example, individuals require greater physical involvement to participate in most health-related initiatives. Placing a piece of trash into a wastebasket is a fairly effortless act, which does not require a great deal of physical commitment. Perhaps the amount of exertion required to perform the desired outcome should be considered in future research. In addition, the act of littering has consequences that are far more external than not exercising. It makes sense that the act of littering would be influenced by injunctive messages that purport to represent how society views the act of littering. In contrast, not being physically active has the most direct and negative consequences to the individual. Failure to participate in a stair-climbing initiative does not harm society in any direct way. The only conceivable influence that failure to use the stairs might have on society is increased costs associated with health care programs which was not a likely consideration for the participants in this study. Based on this rationale, it is

captivating to consider why the injunctive message was as influential as it was in this study.

A possible explanation for the success of the injunctive message is the manner in which this message was framed. The injunctive message “Don’t be lazy, take the stairs!” was negatively worded with a diagram of a large thumb pointing downward to suggest disapproval. In contrast, the descriptive message “Most people at SMU use the stairs!” was somewhat positively framed with a large diagram of a thumb pointing upward to suggest approval. The method in which these messages were framed may have caused participants in the study to interpret the injunctive message more thoroughly. Indeed, previous research conducted by Smith and Petty (1996) suggests that negatively framed messages are processed more thoroughly than messages in the positive frame. Although the messages used in this study were not intentionally designed as either gained or loss framed it is possible that normative messages may be more influential presented in a negative form. Admittedly, the I/D inconsistent message may have presented some information as a negative descriptive (i.e., Too many people at SMU use the Elevator!); however without pre testing the messages to determine whether or not they present negative or positive qualities this is entirely speculation. This is an interesting consideration that should be explored further in future research.

As seen by the results of the logistic regression analysis, the I/D inconsistent message was not successful at promoting stair-use above a baseline measure (Hypothesis 5 supported). In contrast, the I/D consistent message did promote stair-use above the baseline measurement. This finding supports the final hypothesis

(Hypothesis 7) and offers some evidence that using an injunctive and a descriptive message in tandem may succeed at promoting various target behaviours. However, it is also important to acknowledge that the I/D consistent message has the injunctive element present in its design and may be simply benefiting from its inclusion.

Revisiting the results it is clear that the two messages were alarmingly similar in their influence on stair-use behaviour. When the injunctive condition was present a total of 88.7% of individuals used the stairs versus 88.2% in the I/D consistent. In addition, the injunctive and I/D consistent messages were the only two conditions found to have a significant influence on stair-use behaviour when compared to the baseline condition. In order to tease out the possibility of the injunctive poster condition simply overwhelming the descriptive component future research should investigate the influence of positively worded injunctive elements. Within this study the injunctive poster was negatively framed and may have been less effective if altered to present a more positive message.

The inclusion of the highest rated PHAC message for use in this study added to the strength of the overall findings. During the pre-testing phase of this research the PHAC poster condition “Walking up stairs burns almost 5 times more calories than riding an elevator” was identified as the most influential at promoting stair-use among the 14 PHAC conditions. The fact that the most influential PHAC message was utilized in this study and was still found to be ineffective at promoting stair-use, above a baseline measurement, is an impressive finding. The inclusion of the aforementioned poster prompt offered an overwhelming advantage for the discovery of a possible effect when using the PHAC condition; however results indicated that

the PHAC message was not effective at promoting stair-use above the baseline measurement (Hypothesis 1 supported). This result is exciting and offers evidence that point-of-decision prompts directed toward health related behaviours might be more influential when using a normative framework. It is also possible that the inclusion of a lesser-rated PHAC poster prompt would have resulted in an even greater difference between the novel poster conditions and the current PHAC designs. Obviously this possibility will have to be explored further before any definitive conclusions can be made.

Within the pre-testing phase of this project some very interesting results were obtained. Although previous research has used similar methodologies to determine the effectiveness of arguments based on Cialdini's framework, this study was the first of its kind to create, and test, point-of-decision prompts based on this rationale. Moreover, the results of the pre-testing phase suggest that a clear distinction between descriptive and injunctive health related messages could be accomplished. This distinction is an important first step for researchers attempting to design creative interventions based on a normative framework. A surprising finding within the pre-testing phase of the current study was the relationship between the simple and complex messages. After reviewing the results it was clear that the descriptive message and the I/D consistent message were remarkably similar. This finding makes theoretical sense when considering the actual composition of the message. Since the I/D consistent poster has the descriptive message as part of a more complex statement, it is reassuring that the two messages were not found to be significantly dissimilar. On the other hand, a clear distinction was made between the descriptive

and I/D inconsistent messages. Again, since the I/D inconsistent message is contrary to the descriptive message it seems appropriate that they were significantly different. Prior to this study there was no published research available that made clear distinctions between simple and complex normative messages. This result has important implications for future research and will be discussed in detail later in this document.

Interestingly, qualitative information such as first hand testimonials and accounts from faculty, staff and students familiar with the study suggested that the PHAC message was the most admired and the injunctive the most offensive. Although individuals had positive affective reactions toward the PHAC message it was proven unsuccessful at promoting stair use in this study. At first this result seemed surprising; however after revisiting Bator's and Cialdini (2000) article on PSAs I was able to rationalize this result. Bator and Cialdini point out that simply having an emotional (affective) response to a PSA is not enough to motivate individuals to act in a certain manner. The authors used the "Iron Eyes Cody" example, previously mentioned in this research, as an example of how public opinion related to a PSA does not guarantee the outcome of desire. Additionally, research conducted by Leonhardt (1998) suggested the enormously expensive (\$385 million dollars) "Got Milk?" advertisements were correlated with a decrease in milk consumption. Although public opinion was very high for the celebrity promoted commercials, the behaviour of the public was not altered in the desired way.

Additionally, research conducted in the attitude change domain suggests that coinciding argument types alters specific attitude types. For example, early theories

proposed by Millar and Millar (1990) suggested affective attitudes were most highly influenced by a rational (cognitive) counterarguments. This view has since been revised by various researchers (Fabrigar & Petty 1999) to suggest that an affective attitude is most highly influenced by an affective argument. Within this study individuals had an affective reaction to the PHAC message; however it was determined to be ineffective at promoting stair use. The ineffectiveness of the PHAC message in this study should be investigated further; however it is important to note that eliciting an emotional reaction is simply not enough. Designers of future poster prompts would be well advised to consider alternative methods for motivating the target audience such as the ones utilized in this study.

#### *Future Research*

As previously mentioned, the distinction between simple and complex normative messages was achieved in this research study. Consequently, there are numerous implications for researchers and practitioners attempting to create poster prompts, or health related PSAs, for use in future interventions. First, acknowledging the use of the simple injunctive message was most successful in this study; future research should investigate the impact of injunctive-framed messages. A simple message may be more successful at altering individual behaviour based on the actual length and effort needed for encoding. Second, future research should build on the distinction between simple and complex messages and the measures associated with assessing them. This study was the first of its kind to attempt to establish a clear distinction between simple, complex, consistent and inconsistent messages. The creation of a valid measure for assessing differences or similarities between these

constructs would be extremely useful for practitioners and researchers alike. Finally, incorporation of the simple and complex messages into influencing health related behaviours should be investigated further within a variety of health related paradigms.

Within the main observational component of this study the injunctive condition was highlighted as being the most influential on stair use behaviour. Future research should investigate the possibility that some normative messages may be more effective in different contexts. For example, the use of a PSA derived from a descriptive framework may be more appropriate when designing pro-environmental messages. Conversely, injunctive messages might hold more merit when designing health related PSAs. Future studies should explore this possibility.

The success of the injunctive condition at promoting stair use within this study suggests that previously held notions of when to use descriptive messages may be in doubt. Research conducted by Cialdini et al. (2003) suggests use of a descriptive message when the behaviour of interest is prevalent. Admittedly, this recommendation was given under the pretence that research would be conducted in the pro-environmental domain; however future research should explore the possibility that different behavioural outcomes (e.g., hand-washing, stair use, etc.) are contextually influenced by the various normative conditions. The use of a descriptive message may be more appropriate when attempting to alter behaviour that is prevalent in some conditions but not in others. In order to test this possibility an examination of the effectiveness of all four normative conditions used in this study on a variety of different behavioural constructs is suggested.

An interesting component of this research study was the potential influence of second party pedestrians. It is possible that the simple act of witnessing another individual use the stairs (or elevator) influenced participants to act similarly. Future research should investigate the impact of confederates on the stair-use behaviour of individuals. This would be a fairly simplistic study that would have a confederate either waiting for an elevator or using the stairway as participants approached the poster prompt. Understanding this aspect of social influence would assist in the overall evaluation of Cialdini's various conditions.

This design of this research included a two-week baseline measurement followed by four weeks of data collection. Future research should incorporate a two-week post intervention measure to assess the sustainability of the poster prompts. This is an important consideration that was not included in this research based on the academic schedule of the population being sampled. This research was conducted in the middle of an academic session and the researchers felt increasing the data collection to encompass an examination period and a new semester would contaminate the results. In this sense the data collected was uniform in as many ways as possible (e.g., time of year, traffic volume etc.).

Finally, future research should investigate the impact of negatively framed descriptive messages and positively framed injunctive messages in isolation. Although the injunctive message was successful at promoting stair-use above a baseline measure future research should attempt to determine if the influence of the injunctive message is based on the framing. A negatively framed descriptive message may be equally influential on stair-use behaviour. Conversely, the use of a positively

framed injunctive message may not be as influential as the injunctive message used in this study.

### *Limitations*

It is possible that the inclusion of only one PHAC poster condition may have inadvertently reduced the likelihood of an effect from the remaining 13 poster conditions. Albeit the original 14 conditions were pre-tested for overall effectiveness it is still possible that an effect could have been discovered from one of the excluded conditions. Although the possibility of a missed effect is low, future research involving evaluation of the PHAC conditions should include a larger number of the existing messages in any analysis. Nonetheless, it is important to note that the PHAC condition that was used was rated the highest in the pre-testing phase of this research and therefore offered the greatest chance of success.

The overall increase in the “no poster” condition used in this study does indicate the potential for spill over effects. Although the “no poster” condition did increase somewhat versus the baseline measurement it is important to note that this increase was not significant within the logistic regression analysis. In addition, if a spill over effect was increasing the “no poster” condition one would expect the other poster conditions such as the PHAC and I/D inconsistent posters to also be influenced in some manner. If spill over is occurring these messages are much worse than initially discovered within this study.

Since this study used naturalistic observation for data collection it is prone to all limitations associated with an observational design. Possible issues include experimenter bias or the possibility that participants within the study realized they

were being observed as they approached the various stairways (e.g., Hawthorne effect). Although the researchers were not completely blind to the poster conditions that were present they were not informed of the hypotheses related to this research. In addition, all of the observers within this study had identical training and attempted to be as inconspicuous as possible when collecting data. Specifically, observers attempted to blend into the natural environment by sitting at tables appearing to be reading a book, standing reading a bulletin board, or casually talking with a friend. All of the aforementioned behaviours are not uncommon within a University setting. Although the use of trained observers was successful in this study, future research that is conducted in an attempt to examine stair-use behaviour should utilize a variety of different methods. Some suggestions include counters on doorways, video cameras, and pressure mats. The latter seems to be the least invasive and is commonly used in mass transit and public buildings to measure pedestrian traffic volume. Future research would benefit from the inclusion of this device.

Another possible limitation within this study was the use of the novel pre-testing measure. This instrument was created to assess the overall validity of the poster conditions for this study specifically; however there is no psychometric support for its use. Although on the surface this instrument did possess face validity; future research conducted within this domain should attempt to create a psychometrically valid and reliable tool.

Finally, it is possible that a university population is unique in its demographic. Future research should try to replicate the findings within this study using alternative populations (e.g., shopping malls, hospitals, etc.).

## Conclusion

The results of this thesis suggest that stair-use behaviour can be influenced by point-of-decision prompts based on the theory of normative conduct. More specifically, this study was able to identify two poster conditions that were successful at increasing stair usage within a University setting. This finding has important implications for health related PSAs and for researchers using social norms as a motivational tool for behaviour change. However, in order to fully understand the impact social norms have on health-related behaviours future research is suggested that incorporate recommendations from this research piece and new findings within the ever changing world of applied psychological research.

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## Pre-testing Measure

We are interested in what thoughts and feelings came into your mind when you thought about **the health-related poster** you just viewed. You probably have positive, negative, or neutral reactions, thoughts and feelings about **the poster**. We are simply interested in knowing what those thoughts and feelings are.

Below, you will find a series of boxes. Simply list what it is that you are thinking or feeling when you think about **the poster**. Write down the first idea that comes into your mind in the first box, the second in the second box, etc. Please put only one thought or feeling per box. Only try to record those thoughts, ideas, and feelings you had while you were **viewing the health related poster**. Do not worry about grammar, spelling or complete sentences.

Use only as many boxes as you need. If you can only remember 4 thoughts or feelings, use only 4 boxes. You do not have to use each and every box, only as many boxes as ideas you have. Please begin now, and spend at least 3, but no more than 5 minutes listing the thoughts and feelings you had when you were thinking about **the poster**.



Now that you have completed listing all the thoughts, feelings, and reactions you had while thinking about **the poster** you just viewed, please flip back to the previous pages where you listed them in the boxes and decide if each thought or feeling listed was either positive, negative, or neutral regarding **the poster**. If you decide the thought or feeling you listed was positive, please mark a plus sign (+) beside the left hand side of the box, in the margin. If the thought or feeling you listed is decidedly negative, please place a minus sign (-) on the left of the box, in the margin. If the thought or feeling listed is neutral, please put a zero (0) on the left side of the box, in the margin. For example, if you decide that the thought or feeling you listed in the first box is positive toward **the poster**, please mark a plus sign to the left of the box. This should only take you a minute or two. Please begin.

**ONCE YOU HAVE COMPLETED THE ABOVE TASK, MOVE ON TO THE NEXT PAGE.**

1. Did you think the poster was a **well-written** argument concerning the use of stairs?

1	2	3	4	5	6	7
Poorly Written			Neutral			Very Well-written

2. Did you think the poster was a **convincing** argument concerning the use of stairs?

1	2	3	4	5	6	7
Not at all Convincing			Neutral			Very Convincing

3. Did you think poster was an **effective** argument concerning the use of stairs?

1	2	3	4	5	6	7
Not at all Effective				Neutral		Very Effective

4. Did you think the poster was a **strong** argument concerning the use of the stairs?

1	2	3	4	5	6	7
Very Weak			Neutral			Very strong

5. Please rate on a scale of 1-7 (1 being 'not at all' and 7 being 'definitely') your attitude toward **the poster** you just viewed:

<b>Positive</b>						
1	2	3	4	5	6	7
Not at all			Neutral			Definitely

<b>Useless</b>						
1	2	3	4	5	6	7
Not at all			Neutral			Definitely

<b>Worthless</b>						
1	2	3	4	5	6	7
Not at all			Neutral			Definitely

<b>Negative</b>						
1	2	3	4	5	6	7
Not at all			Neutral			Definitely

<b>Effective</b>							
1	2	3	4	5	6	7	
Not at all			Neutral				Definitely
<b>Valuable</b>							
1	2	3	4	5	6	7	
Not at all			Neutral				Definitely
<b>Useful</b>							
1	2	3	4	5	6	7	
Not at all			Neutral				Definitely
<b>Ineffective</b>							
1	2	3	4	5	6	7	
Not at all			Neutral				Definitely

6. To what extent did the poster describe that using the stairs is a **common occurrence**?

1	2	3	4	5	6	7
Not at all common			Neutral			Very common

7. To what extent did the poster describe that using the stairs frequently was a **rare occurrence**?

1	2	3	4	5	6	7
Not at all rare			Neutral			Very rare

8. To what extent did poster describe that using the stairs excessively was something your peer group is **likely** to do?

1	2	3	4	5	6	7
Not at all likely			Neutral			Very likely

9. To what extent did the poster describe that using the stairs was something your peer group is **unlikely** to do?

1	2	3	4	5	6	7
Not at all unlikely			Neutral			Very unlikely

10. To what extent did the poster describe that using stairs excessively is an **appropriate** way to behave?

1	2	3	4	5	6	7
Not at all appropriate			Neutral			Very appropriate

11. To what extent did the poster describe that using the stairs excessively is an **inappropriate** way to behave?

1	2	3	4	5	6	7
Not at all inappropriate			Neutral			Very inappropriate

12. To what extent did the poster encourage you to use the stairs?

1	2	3	4	5	6	7
Not at all			Somewhat			Definitely

13. How often do you use the stairs on campus?

1	2	3	4	5	6	7
Not at all			Sometimes			Always

14. How often do you think other students use the stairs on campus?

1	2	3	4	5	6	7
Not at all			Sometimes			Always

### Demographics

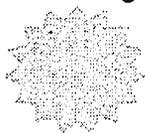
1. Age: \_\_\_\_\_

2. Gender: a. Male b. Female

3. What year of study are you completing (e.g., 1<sup>st</sup>, 2<sup>nd</sup>, etc.)? \_\_\_\_\_

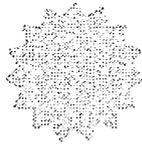
4. Poster ID (located on the top right hand corner of poster). \_\_\_\_\_

Appendix B: Poster Conditions  
PHAC Message #1



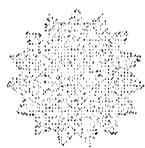
When you  
go up,  
your  
blood  
pressure  
goes down.





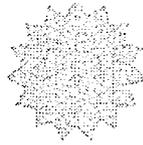
A flight  
a day may  
keep  
chronic  
disease  
away.





The victory  
is not always  
to the  
swift, but to  
those who  
keep moving.





Physical  
activity will  
add years  
to your life,  
and life to  
your years.





The first  
wealth  
is  
health.

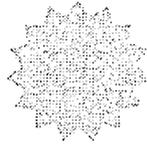
(Ralph Waldo Emerson)





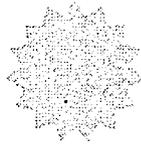
Walking  
up stairs  
burns almost  
5 times more  
calories than  
riding an  
elevator.





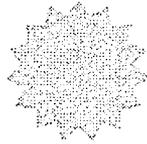
In one minute,  
a 150 pound  
person burns  
approximately  
10 calories  
walking up stairs,  
and only 1.5  
calories riding  
an elevator.





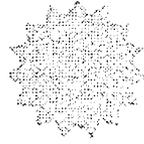
There are  
1440 minutes  
in every day...  
schedule 30  
of them for  
physical  
activity.





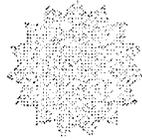
No  
waiting  
one door  
over.





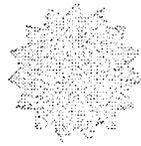
Small  
steps  
make big  
differences.





Raise your  
fitness level,  
one step  
at a  
time.





Fight fat...  
Feel fit...  
Frequent  
these  
flights.





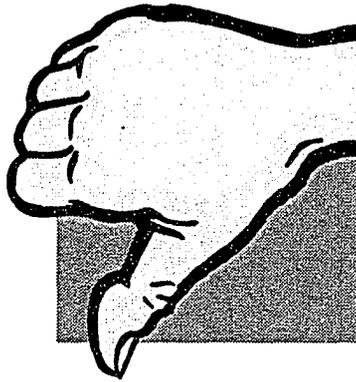
Step up  
to a  
healthier  
lifestyle.





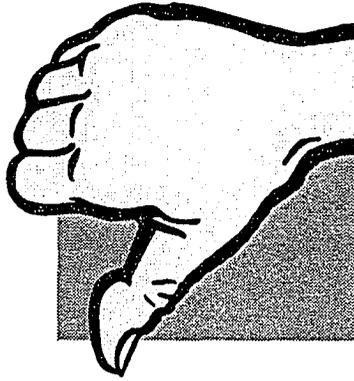
Now  
that you  
have  
refueled...





Too many people at  
SMU use the elevator!  
Don't be lazy, take the  
stairs!





Don't be lazy,  
take the  
stairs!

Most people  
at SMU use  
the stairs!



Take the Stairs



Most people at SMU  
use the Stairs! Don't  
be lazy, take the  
stairs!



Take the Stairs

## Appendix C: Testing Schedule

Week	Condition	Time	Location
Monday March 14th	<i>Week 1</i>		
	Baseline	10-10:30	MM Basement
	Baseline	11-11:30	MN 5 <sup>th</sup> Floor
	Baseline	12-12:30	MS Basement
	Baseline	1-1:30	MM 3rd Floor
	Baseline	2- 2:30	MS 4th Floor
	Baseline	3-3:30	MN Basement Floor
Wednesday March 16th			
	Baseline	10-10:30	MM 3 <sup>rd</sup> Floor
	Baseline	11-11:30	MS 4th Floor
	Baseline	12-12:30	MN Basement Floor
	Baseline	1-1:30	MS Basement
	Baseline	2- 2:30	MN 5 <sup>th</sup> Floor
	Baseline	3-3:30	MM Basement
Thursday March 17 <sup>th</sup>			
	Baseline	10-10:30	MN Basement
	Baseline	11-11:30	MS Basement
	Baseline	12-12:30	MM Basement
	Baseline	1-1:30	MS 4th Floor
	Baseline	2- 2:30	MN 5 <sup>th</sup> Floor
	Baseline	3-3:30	MM 3 <sup>rd</sup> Floor
Monday March 21st	<i>Week 2</i>		
	Baseline	10-10:30	MM Basement
	Baseline	11-11:30	MN 5 <sup>th</sup> Floor
	Baseline	12-12:30	MS Basement
	Baseline	1-1:30	MM 3rd Floor
	Baseline	2- 2:30	MS 4th Floor
	Baseline	3-3:30	MN Basement Floor
Wednesday March 23rd			
	Baseline	10-10:30	MM 3 <sup>rd</sup> Floor
	Baseline	11-11:30	MS 4th Floor
	Baseline	12-12:30	MN Basement Floor
	Baseline	1-1:30	MS Basement
	Baseline	2- 2:30	MN 5 <sup>th</sup> Floor
	Baseline	3-3:30	MM Basement
Thursday March 24 <sup>th</sup>			
	Baseline	10-10:30	MN Basement
	Baseline	11-11:30	MS Basement
	Baseline	12-12:30	MM Basement
	Baseline	1-1:30	MS 4th Floor
	Baseline	2- 2:30	MN 5 <sup>th</sup> Floor

	Baseline	3-3:30	MM 3 <sup>rd</sup> Floor
Monday March 28th	<i>Week 3</i>		
	No Poster	10-10:30	MM Basement
	Descriptive	11-11:30	MN 5 <sup>th</sup> Floor
	PHAC	12-12:30	MS Basement
	I/D Inconsistent	1-1:30	MM 3rd Floor
	Injunctive	2- 2:30	MS 4th Floor
	I/D Consistent	3-3:30	MN Basement Floor
Wednesday March 30th			
	I/D Inconsistent	10-10:30	MM 3 <sup>rd</sup> Floor
	Injunctive	11-11:30	MS 4th Floor
	I/D Consistent	12-12:30	MN Basement Floor
	PHAC	1-1:30	MS Basement
	Descriptive	2- 2:30	MN 5 <sup>th</sup> Floor
	No Poster	3-3:30	MM Basement
Thursday March 31st			
	I/D Consistent	10-10:30	MN Basement
	PHAC	11-11:30	MS Basement
	No Poster	12-12:30	MM Basement
	Injunctive	1-1:30	MS 4th Floor
	Descriptive	2- 2:30	MN 5 <sup>th</sup> Floor
	I/D Inconsistent	3-3:30	MM 3 <sup>rd</sup> Floor
Monday April 4th	<i>Week 4</i>		
	I/D Consistent	10-10:30	MM Basement
	No Poster	11-11:30	MN 5 <sup>th</sup> Floor
	Descriptive	12-12:30	MS Basement
	PHAC	1-1:30	MM 3rd Floor
	I/D Inconsistent	2- 2:30	MS 4th Floor
	Injunctive	3-3:30	MN Basement Floor
Wednesday April 6th			
	PHAC	10-10:30	MM 3 <sup>rd</sup> Floor
	I/D Inconsistent	11-11:30	MS 4th Floor
	Injunctive	12-12:30	MN Basement Floor
	Descriptive	1-1:30	MS Basement
	No Poster	2- 2:30	MN 5 <sup>th</sup> Floor
	I/D Consistent	3-3:30	MM Basement
Thursday April 7th			
	Injunctive	10-10:30	MN Basement
	Descriptive	11-11:30	MS Basement
	I/D Consistent	12-12:30	MM Basement
	I/D Inconsistent	1-1:30	MS 4th Floor
	No Poster	2- 2:30	MN 5 <sup>th</sup> Floor
	PHAC	3-3:30	MM 3 <sup>rd</sup> Floor
Monday April 11th	<i>Week 5</i>		

	Descriptive	10-10:30	MM Basement
	I/D Consistent	11-11:30	MN 5 <sup>th</sup> Floor
	I/D Inconsistent	12-12:30	MS Basement
	Injunctive	1-1:30	MM 3 <sup>rd</sup> Floor
	No Poster	2- 2:30	MS 4th Floor
	PHAC	3-3:30	MN Basement Floor
Wednesday April 13th			
	Injunctive	10-10:30	MM 3 <sup>rd</sup> Floor
	No Poster	11-11:30	MS 4th Floor
	PHAC	12-12:30	MN Basement Floor
	I/D Inconsistent	1-1:30	MS Basement
	I/D Consistent	2- 2:30	MN 5 <sup>th</sup> Floor
	Descriptive	3-3:30	MM Basement
Thursday April 14th			
	PHAC	10-10:30	MN Basement
	I/D Inconsistent	11-11:30	MS Basement
	Descriptive	12-12:30	MM Basement
	No Poster	1-1:30	MS 4th Floor
	I/D Consistent	2- 2:30	MN 5 <sup>th</sup> Floor
	Injunctive	3-3:30	MM 3 <sup>rd</sup> Floor
Monday April 18th	<i>Week 6</i>		
	PHAC	10-10:30	MM Basement
	I/D Inconsistent	11-11:30	MN 5 <sup>th</sup> Floor
	Injunctive	12-12:30	MS Basement
	No Poster	1-1:30	MM 3 <sup>rd</sup> Floor
	I/D Consistent	2- 2:30	MS 4th Floor
	Descriptive	3-3:30	MN Basement Floor
Wednesday April 20th			
	No Poster	10-10:30	MM 3 <sup>rd</sup> Floor
	I/D Consistent	11-11:30	MS 4th Floor
	Descriptive	12-12:30	MN Basement Floor
	Injunctive	1-1:30	MS Basement
	I/D Inconsistent	2- 2:30	MN 5 <sup>th</sup> Floor
	PHAC	3-3:30	MM Basement
Thursday April 21st			
	Descriptive	10-10:30	MN Basement
	Injunctive	11-11:30	MS Basement
	PHAC	12-12:30	MM Basement
	I/D Consistent	1-1:30	MS 4th Floor
	I/D Inconsistent	2- 2:30	MN 5 <sup>th</sup> Floor
	No Poster	3-3:30	MM 3 <sup>rd</sup> Floor



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