

2013

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Recommended Citation

Phillipson, Lyn; Jones, Sandra C.; Larsen-Truong, Karen; Robinson, Laura; and Barrie, Lance, "Using social marketing to promote cold and flu prevention behaviors on an Australian university campus" (2013). *Faculty of Social Sciences - Papers*. 1251.
<https://ro.uow.edu.au/sspapers/1251>

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Abstract

Background: Cold and influenza transmission is a serious public health issue for universities. This case study describes a coordinated social marketing campaign that incorporated health messages and products. It was designed to motivate behavior change to prevent the spread of colds and influenza on a university campus. **Methods:** The aims of this multi-component intervention were to raise awareness of the importance of individual behavior in preventing the spread of colds and flu and to encourage staff and students to adopt three simple habits: hand washing, cough or sneeze in sleeve, and stay at home if sick. A repeated, cross-sectional survey design assessed the following pre- and post-campaign: salience of colds and flu; perceived severity of, and susceptibility to, colds and flu; beliefs about effective prevention strategies; and engagement in preventative behaviors. Campaign message and product recall were assessed post-campaign. **Results:** Campaign message recall was high (over 80% of staff and 70% of students); fewer staff (one-third) or students (one-quarter) recalled campaign products. Few pretest-posttest differences were observed in perceived susceptibility or severity. Recognition of "cough or sneeze into your sleeve" as an effective prevention strategy increased pre- to post-campaign (a percentage increase of 39.6% for staff and 25.1% for students); campaign exposed respondents were significantly more likely than unexposed to rate this strategy as effective post-campaign. Substantial pretest-posttest percentage increases in the top ranked prevention strategies were found for the three core messages: "hand washing" (51% for students); "cough in sleeve" (59.2%, staff; 71.1%, students); and "stay at home if sick" (120%, staff). **Conclusions:** This setting-based intervention clearly reached staff and students with the primary messages. Success can be attributed to using consumer insight to develop multiple marketing messages and strategies, rather than a single- strategy communication campaign.

Keywords

cold, flu, marketing, prevention, social, behaviors, australian, university, campus, promote

Disciplines

Education | Social and Behavioral Sciences

Publication Details

Phillipson, L., Jones, S. C., Larsen-Truong, K., Robinson, L. & Barrie, L. (2013). Using social marketing to promote cold and flu prevention behaviors on an Australian university campus. *Cases in Public Health Communication and Marketing*, 7 99-119.

Using Social Marketing to Promote Cold and Flu Prevention Behaviors on an Australian University Campus

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Suggested Citation: Phillipson L, Jones SC, Larsen-Truong K, Robinson L, Barrie L. Using social marketing to promote cold and flu prevention behaviors on an Australian university campus. *Cases in Public Health Communication & Marketing*. 2013;7:99-119.

Available from: www.casesjournal.org/volume7.

Abstract

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Methods: The aims of this multi-component intervention were to raise awareness of the importance of individual behavior in preventing the spread of colds and flu and to encourage staff and students to adopt three simple habits: hand washing, cough or sneeze in sleeve, and stay at home if sick. A repeated, cross-sectional survey design assessed the following pre- and post-campaign: salience of colds and flu; perceived severity of, and susceptibility to, colds and flu; beliefs about effective prevention strategies; and engagement in preventative behaviors. Campaign message and product recall were assessed post-campaign.

Results: Campaign message recall was high (over 80% of staff and 70% of students); fewer staff (one-third) or students (one-quarter) recalled campaign products. Few pretest-posttest differences were observed in perceived susceptibility or severity. Recognition of “cough or sneeze into your sleeve” as an effective prevention strategy increased pre- to post-campaign (a percentage increase of 39.6% for staff and 25.1% for students); campaign exposed respondents were significantly more likely than unexposed to rate this strategy as effective post-campaign. Substantial pretest-posttest percentage increases in the top ranked prevention strategies were found for the three core messages: “hand washing” (51% for students); “cough in sleeve” (59.2%, staff; 71.1%, students); and “stay at home if sick” (120%, staff).

Conclusions: This setting-based intervention clearly reached staff and students with the primary messages. Success can be attributed to using consumer insight to develop multiple marketing messages and strategies, rather than a single-strategy communication campaign.

Keywords: Influenza (human), Respiratory tract infections, Health behavior, Social marketing, Universities.

Introduction

Seasonal influenza and the common cold are illnesses with serious implications for health, the ability to work, and to study. Influenza data (reported only at a state-level in Australia) indicates that, over the last several years, the numbers of notified cases of influenza have varied greatly. Cases ranged from as many as 12,676 cases in 2009, to 1,594 confirmed cases in 2010, and 5,672 cases in 2011.^{1,2} Despite the overall numbers, more than 60 of these cases required admission to Intensive Care Units in each year.¹⁻³ Whilst universities in Australia do not routinely collect staff and student health data, it is expected that transmission and infection risks in universities are similar to those in closed communities (such as health care settings and schools). This presents a serious public health issue for universities.

In 2011, our university funded the research team to develop and implement a campus based

social marketing intervention, to reduce the spread of colds and flu among the student and staff population. The campaign consisted of six stages including a comprehensive evaluation. The communication objectives of the campaign were as follows: (1) to raise awareness of the importance of preventing the spread of colds and flu, and (2) to provide clear messages to students and staff concerning actions they could take to reduce their risk of contracting or spreading colds and flu. The behavioral objectives were to encourage staff and students to engage in three prevention behaviors: (1) wash their hands, (2) cough and sneeze into their sleeve, and (3) stay at home if they are sick. The objective of this case study was to demonstrate whether a coordinated social marketing campaign, going beyond health messages, could motivate behavior change to reduce the spread of infectious disease on a university campus.

Background

Seasonal influenza in Australia is estimated to cause 18,000 hospitalizations and over 300,000 General Practitioner consultations annually.⁴ Between 1,500 and 3,500 Australians die each year from influenza and its complications, though actual figures are expected to be far higher than these because medical practitioners do not see all cases of contagious illnesses, and not all are classified as notifiable diseases.⁵

Influenza and other viral infections are commonly spread person-to-person by inhaling infectious droplets transmitted when talking, coughing or sneezing.⁶ Viruses also persist on hard surfaces

for up to two days, and can be transmitted from tissues to hands for up to fifteen minutes and from surfaces to hands for up to five minutes.⁷ These modes of transmission contribute to individuals in closed communities, such as schools, hospitals, and elderly care facilities, being at high risk of contracting infectious illness. Transmission occurs primarily because the spread of the virus is aided by close human contact, humidity and diminished ventilation.⁸ Due to these factors, promotion of infection control messages and practices is recommended in many community settings.⁸ Behaviors that reduce the spread of, or protect against infection from, contagious illness include

washing hands regularly, covering the nose and mouth when coughing or sneezing, avoiding close contact with others, regularly cleaning surfaces, and not sharing personal items.⁶ Research shows these simple measures are highly effective in reducing virus transmission.^{9, 10}

Universities host a large number of students and staff daily; they use shared facilities and spend time together indoors in classrooms, libraries, and offices. As such, it is expected that transmission risks in universities are similar to those in closed communities (such as health care settings and schools). This presents a serious public health issue for universities.

Whilst there are some examples of cold and flu campaigns that have been conducted on university and college campuses in Australia and internationally, most have been implemented by internal marketing and communication departments and provide limited publically available data on the nature or effectiveness of programs. Of the only two published evaluated studies identified, one control study utilized hand hygiene messages and provision of gel sanitizer to improve knowledge, hand hygiene behaviors and decrease both cold and flu symptoms and days absent from class in residents of university accommodation.¹¹ The other study focused mainly on the provision of influenza information (eg, prevalence amongst students, symptoms, and management), as well as promoting the uptake of the H1N1 vaccine at a university health clinic on campus.¹² Whilst a post-intervention evaluation showed high recall of specific campaign elements, such as the posters and flyers (73%), and uptake of the seasonal flu (49.3%) and H1N1 vaccines (38.3%), there was no pre-campaign data (and no control group). As a result, no firm conclusions about campaign effectiveness can be drawn. Previous interventions demonstrated the potential of the university setting as an effective location to deliver campaigns to prevent cold and flu viral infection. Further research is needed to gain greater insight into the factors influencing the cold and flu knowledge,

attitudes, and behaviors of staff and students on college campuses, and the strategies that might be most effective in creating supportive, healthy, university environments.

Social marketing is one framework or process that places consumer insight and research as central to its approach, and has been successfully used to elicit behavior and attitude change at a group or community level. Social marketing is commonly defined as a program-planning process that applies concepts and techniques of commercial marketing to promote voluntary behavior change using a range of theories, principles, and models.¹³

Anecdotal evidence suggests that Australian university students are not aware of, or not following, the basic procedures necessary to reduce the transmission of illnesses. Perhaps most notable is the tendency to cough or sneeze directly into the air, or into their hands, and then touch communal surfaces such as computers and door handles, rather than into their sleeve/armpit or a disposable tissue. A social marketing approach was adopted in this project because:

- *We are selling a voluntary behavior* and the most effective tools for reducing morbidity from influenza are self-protection behaviors.
- *The beneficiary of the behavior change* includes the individuals themselves, their families and social groups, and the population as a whole.
- *We offer an exchange with the consumer* to persuade them that the benefits of engaging in these behaviors exceed the perceived costs.
- *We adopt a consumer orientation* to understand the target audiences' knowledge, beliefs, attitudes, concerns, and current behaviors to develop appropriate communication strategies.
- *We need an integrated marketing mix* in order to: sell the preventative behaviors and reduce the risks of spreading or contracting cold and flu ("product"); reduce the perceived costs ("price"); use a range of channels ("place"); and develop messages that are sufficiently innovative and

appealing to capture their attention (“promotion”).

As such, this project has the potential to generate new evidence on the effectiveness of university

campus interventions. The study also helps to demonstrate the utility of using social marketing approaches to inform and improve cold and flu programs conducted on university campuses.

Methods

All the essential steps for the development of a social marketing program were followed including: a review of previous campaigns, formative research with target audience members, materials development and pretesting, intervention development and implementation, and evaluation. The study protocol was reviewed and approved by the University Human Research Ethics Committee.

Formative Research and Pretesting

Materials review. First, we conducted a review of existing campaign materials (focused on addressing the transmission of viral infections, particularly targeting university populations or young adults). The review identified that most campaigns focused on education. In Australia, state-based campaigns were primarily focused on promotion of hand washing and “stay at home” messages; most campaigns are communicated via mass media and included some use of posters and online media.

Formative research. In the second phase, a series of four focus groups were conducted with university students (both domestic and international) and staff to discuss knowledge, attitudes and behaviors related to the prevention and transmission of colds and the flu. The groups focused on perceived benefits of, and barriers to, behaviors that would prevent cold and flu transmission. The focus groups were mixed gender groups, used a pre-defined discussion guide, and were facilitated by an experienced qualitative researcher. The focus group participants

also reviewed and discussed some of the existing materials (identified in the materials review) and explored responses to the different messages and images. This step in the research process was crucial as it guided the message development and also allowed the research team to gain a deeper understanding of the target group’s motivations, intentions, and behaviors.

Staff were concerned about influenza (more so than the common cold) because of its likely impact on work. Concerns included letting down their co-workers and supervisors by staying home or not being able to work effectively. Staff reported that they tend to “soldier on” when they are sick; while they generally viewed this in a negative light, they felt they often had no choice in order to keep up with the workload. Staff suggested useful strategies for preventing the spread of colds and flu on campus would be the provision of hand sanitizer and tissues at reception and service counters. In relation to a university-funded staff-directed campaign, they did not want to be “babied,” but did want to know that the University cares and looks after them by presenting helpful and useful information and resources. Staff also expressed a desire for a targeted campaign for students about being socially responsible as they saw this as potentially having a big impact on the spread of colds and flu on campus.

Students were not overly concerned about colds or flu except during exams or busy times during the academic year. They felt they needed to attend the university, even when sick, because of school

policies limiting the number of absences. Absences exceeding those limits require submission of paperwork for special consideration; a difficult and time consuming process that is associated with uncertain outcomes. Students were concerned about others not being responsible when they are sick (eg, not covering their mouth when they cough). However, students admitted they take few precautions to prevent spreading it to others when they are sick. Recommendations for a university campaign included preferences for scientific evidence about prevention, as well as messages emphasizing respect for others and reinforcing positive prevention behaviors (eg, hand washing, staying at home when sick). Students also discussed practical and environmental changes that could be made in common areas, such as the library or computer labs, to facilitate a cleaner work area. They suggested putting hand washing stations and disinfectant wipes for computer keypads at the front entrance of common areas (eg, lecture theatres, library, and computer labs).

Materials development and pilot-testing.

University graphic design students were engaged to develop a series of creative concepts for use in the social marketing campaign. Formative research indicated that staff and students wanted messages to promote social responsibility and provide effective ways of reducing the spread of colds and flu. These findings were used to develop key messages and a design brief for the graphic design students. Together with research staff, the students developed several different poster designs with the campaign slogans emphasizing the messages and prevention behaviors. Four focus groups were then conducted with students to test the creative concepts. Group discussions focused on the perceived appropriateness, effectiveness and interpretation of the messages, the suitability of the images, and overall general impressions and opinions.

Intervention Development

Campaign Messages. Results from the formative

research and pretesting facilitated the development of the cold and flu campaign messages and tone. Final creative executions for students had a fun tone to attract people to them, but had a serious and consistent message (Figure 1). The key campaign message addressed the issue of social responsibility, while the three recommended behaviors provided the target audience with simple strategies for carrying them out. The creative executions for staff had a more serious tone and emphasized the impact on others of being sick in the work place. The images of professional people showed the recommended behaviors. The campaign objectives were to draw on current beliefs and attitudes about colds and flu (identified through the formative research), to raise awareness of the importance of individual behavior in the spread of colds and flu, and to encourage people to adopt simple habits to reduce the spread of colds and flu.

The key campaign slogan was “Cold and flu affects more than you.” The message behind the slogan was the importance of thinking of others to reduce the spread of cold and flu viruses. A core part of the campaign message was a set of recommended behaviors that individuals could adopt to reduce the spread of colds and flu on campus. While there are many effective strategies for reducing the spread of viral infections, three key behaviors were chosen for the campaign: “Wash your hands”; “Cough and sneeze into your sleeve” and “Stay at home if you are sick.” The behaviors were selected because they were likely to be very effective, easy to implement, and memorable. The exception was the “stay at home if you are sick” message that, as we found during formative research, might not be as easy to for students and staff to implement. However, it was decided that this behavior should still be included because it is highly effective at reducing the spread of infection and might be acceptable to staff.

Implementation

The intervention consisted of several key elements including: the display of print and digital posters

Figure 1. Cold and Flu Posters Targeting Student Audience

at various locations on campus; distribution of hygiene centers to key locations; distribution of free merchandise with the campaign messages; flu booths to distribute merchandise and raise awareness; engagement with students and staff through the use of flu characters; the “wall of sneeze” activity; and a campaign Web page.

Media and PR strategy. A media and marketing strategy was developed to deliver the campaign messages through a range of different channels. The campaign was designed to have maximum visual impact, provide opportunities for engagement, and overcome particular barriers to adopting the recommended behaviors. Seven different posters were used throughout the campaign. Each poster depicted a different character, and displayed the campaign slogan and recommended behaviors. Four of the posters were targeted at students (Figure 1) and two were targeted at staff (Figure 2). A seventh, generic poster, which did not have a character and was targeted at both students and staff, was utilized within the Respiratory Hygiene Centres (Figure 3).

Posters. Posters were placed in various locations across the university campus including in each toilet stall (on the back of cubicle doors), next to mirrors in bathroom wash areas, on staff and student notice boards, and in kitchens and other common areas.

A variety of different poster types were placed in these locations; the assessed frequency of staff or student use of the designated areas determined the relative distribution of staff or student posters placed in each. Digital student posters (Figure 1) were also displayed on the university digital signage network.

Media and PR. News stories about the campaign were featured on university TV and the university’s News page. Updates on campaign activities were posted on the research centre’s Facebook page.

Flu campaign Web page. A Web page was developed to provide staff and students with more detailed information about the campaign and how to prevent the spread of colds and flu. The Web page URL was printed on all the campaign merchandise and posters.

Outreach and Engagement Activities

Hygiene Centres. Desktop hygiene centres consisted of a Perspex acrylic display stand, a box of tissues, a bottle of alcohol hand rub, and poster. They were distributed to various key locations across the campus with a particular focus on student service desks such as Student Central, the library, food outlets and staff kitchens. A total of 81 hygiene

Figure 2. Cold and Flu Posters Targeting Staff Audience



Figure 3. Cold and Flu Posters Included within the Respiratory Hygiene Centre



centres were distributed. The hygiene centres allowed easy access to tissues and hand sanitizer at locations where hand to surface or hand to hand contamination was likely, such as service counters. They also provided another means of exposing students and staff to the campaign messages and provided a cue to action to wash hands.

Flu booths. Flu booths were placed in highly visible locations on campus at peak times (eg, lunch times). Research team staff handed out branded campaign merchandise (eg, tissues, pens, hand sanitizer, bookmarks) and engaged with passersby, talking about the campaign and answering any questions. Booths were designed to engage students and staff in a fun way and to increase the visual impact of the campaign. Also present at the flu booths were actors, dressed as geeks, who engaged with students and staff through skits and handed out merchandise to passersby.

Wall of sneeze. Staff were invited by the project team to participate in a competition to encourage recall of the campaign messages. If a staff member could recall at least one campaign message and demonstrate the “cough and sneeze into your sleeve” behavior, they received a free “cold and flu” mug. Photographs taken of participating staff demonstrating the behavior were placed on the flu campaign “wall of sneeze” Web page (see <https://www.uow.edu.au/health/chi/flufacts/UOW109471.html>).

Intervention Evaluation

Process evaluation included monitoring of the number of marketing materials and hygiene centers distributed. Unfortunately, Web page activity and Facebook page visits could not be monitored exclusively for the Cold and Flu campaign. Because both pages appeared with other project news and information, page views could have occurred for any number of projects.

A repeated, cross-sectional survey design was used to assess the following pre- and post-campaign: salience of colds and flu; the perceived severity of, and susceptibility to, colds and flu; beliefs about effective prevention strategies; and engagement in preventative behaviors. The post-campaign survey also incorporated a substantial campaign assessment component: unprompted and prompted recall of campaign activities and messages; source and level of exposure to the intervention; perceptions of effective and ineffective aspects of the intervention; and views about the intervention as a whole and its alignment with the values of the University.

Survey respondents were recruited via university staff and student email networks. It is estimated that approximately 21,000 students and 2,400 staff subscribe to these list serves. Survey data was collected at two time points (pre- and post-campaign) from non-matched samples using an online survey. Data were then exported into an SPSS database (IBM SPSS Version 17) for analysis. The datasets were cleaned to exclude cases where less than 50% of the survey was completed or where data was entered incorrectly throughout.

Data Analysis

Quantitative data analysis included descriptive and cross-sectional analyses at both the pre- and post-campaign time points. Non-parametric statistical tests were conducted to assess differences between staff and students (significance level, $P < .05$) in knowledge, attitudes, and behaviours post-campaign. Due to the repeated cross-sectional survey design, significance tests were not calculated to assess differences between the pre- and post-campaign surveys for either staff or students. Significance tests were only calculated for comparisons between staff and students pre-campaign and post-campaign; the corresponding test statistics are included in the text.

Results

A total of 1,844 posters were displayed on campus during the intervention period. Two posters were also displayed on University digital signs in three key locations (Student Advice, the Library, and Main Noticeboard). Eighty-one Hygiene Centres were distributed for use across campus. Despite numerous requests for advice from university staff members on where to purchase tissue and hand wash refills, no official record was kept regarding the numbers of tissues and alcohol rubs re-purchased or used.

A total of N = 669 staff and students who completed online surveys were included in the pre-campaign survey data analysis and N = 1,175 were included in the post-campaign survey data analysis (Table 1). The main difference between the two samples was in the proportion of staff and students. In the pre-campaign survey, staff represented 65.5% of the sample, while in the post-campaign survey they only represented 20.6% of the sample. We suspect that the lower number of students completing the first survey was largely because it was conducted prior to commencement of lectures.

There were few noteworthy demographic differences between staff respondents on the pre- and post-campaign surveys. Post-campaign staff members were slightly more likely to be female than pre-campaign (77.3% vs 72.8% respectively) and were born in Australia (76.9% vs 71.6% respectively), but they were slightly less likely to be living with a spouse/partner and/or children (74.7% vs 81.7% respectively). Student demographics appeared to differ in the following ways: post-campaign students were more likely to be enrolled part-time than pre-campaign students (16.5% vs 9.5% respectively) and substantially more were living with a spouse/partner and/or children than pre-campaign (21.5% vs 11.2% respectively). Additionally, slightly fewer student respondents post-campaign reported being 24 years

and under than pre-campaign (69.3% vs 80.5% respectively).

Saliency of Colds and Flu

On an open-ended question, students and staff were asked to list the first five infectious diseases that came to mind. Overall, the top ten infectious diseases identified in the pre-campaign survey did not vary considerably from those identified on the post-campaign survey. Influenza was the most commonly identified infectious disease on both surveys for staff and students. The common cold was identified by about one-third of staff (33.6%) on the pre-campaign survey and one-quarter of staff (24.4%) on the post-campaign survey. About one-quarter of students identified the common cold on both the pre- and post-campaign surveys (26.0% and 24.4% respectively). Both students and staff appeared to be more likely to identify AIDS/HIV, hepatitis, and sexually transmitted infections (STIs) on the post-campaign survey.

Perceived Severity of, and Susceptibility to, Colds and Flu

Prior to the campaign most students (66.5%) and staff (66.9%) thought that it was “somewhat” or “very” likely that they would get the flu (Table 2). Views about the likelihood of catching the flu did not change substantially after the campaign. Prior to the campaign, approximately half of the staff (49.6%) and students (60.8%) felt that catching the flu would be “not too serious” or “not at all serious.” Views did not change substantially on the post-campaign survey. Prior to the campaign, the majority of staff (68.1%) and students (69.1%) felt that it would be “not too serious” or “not at all serious” if they caught a cold next winter. After the campaign, the proportions appeared to increase for both staff (81.4%) and students (80.4%). Approximately half

Table 1. Characteristics of Survey Respondents Pre- and Post-Campaign.^a

Characteristics	Staff		Students	
	Pre-campaign (n = 438) %	Post-campaign (n = 242) %	Pre-campaign (n = 231) %	Post-campaign (n = 933) %
Employment Status/Student Status				
Full time	73.0	75.0	90.5	83.5
Part time	27.0	25.0	9.5	16.5
Sex				
Female	72.8	77.3	69.8	72.8
Male	27.2	22.7	30.2	27.2
Age, years				
24 and under	2.6	2.5	80.5	69.3
25 – 34	20.1	23.3	13.6	17.2
35 – 44	25.5	22.5	4.1	6.5
45 – 54	30.7	32.2	1.2	5.6
55 – 64	19.4	18.2	0.6	1.0
65+	1.6	1.3	0.0	0.4
Country of Birth				
Australia	71.6	76.9	88.0	84.0
Other	28.4	23.1	12.0	16.0
Language Spoken at Home				
English	96.0	95.8	92.9	93.1
Other	4.0	4.2	7.1	6.9
Living Situation				
With spouse/ partner and/or children	81.7	74.7	11.2	21.5
Live alone	9.2	16.6	5.3	7.9
With parent(s)	3.9	2.9	46.7	35.8
With friends/acquaintances	3.0	4.1	29.0	28.4
UOW accommodation	0.0	0.0	5.3	5.4
Other	2.3	1.7	2.4	1.0

^a Percentages refer only to those who answered the question.

of the staff (51.9%) and student (48.9%) respondents were “somewhat” or “very” concerned that they might catch a cold next winter in the pre-campaign survey. This proportion was reduced on the post-campaign survey with just over a third of staff (35.1%) and students (38.1%) being concerned.

Prevention Knowledge, Attitudes and Behaviors

Knowledge of prevention behaviors. Before the campaign, the majority of staff (71.9%) and students (72.1%) believed that washing hands frequently was “likely” or “very likely” to reduce their risk of contracting or spreading a cold or flu (Table 3). This remained high after the campaign for both

staff (74.4%) and students (71.5%), thus showing good acceptance of this evidence-based preventative behavior. Before the campaign, 62.1% of staff and 67.1% of student respondents thought that coughing and sneezing into your sleeve would be “likely” or “very likely” to reduce the risk of contracting a cold or flu. After the campaign, this proportion increased considerably to 86.7% for staff and 83.9% for students; this reflects a sizeable percentage increase for staff (39.6%) and students (25.1%). Figure 4 displays the distribution of responses on this particular item for staff and students. There also appeared to be a substantial difference when we compared those who did and did not see the campaign on the post-campaign survey (data not shown). A higher percentage of those who saw the

Table 2. Perceived Likelihood, Severity of, and Susceptibility to the Flu and Colds.^a

Variables	Staff		Students	
	Pre-campaign (n = 438)	Post-campaign (n = 242)	Pre-campaign (n = 231)	Post-campaign (n = 933)
	%	%	%	%
Perceived likelihood of catching the flu next winter				
Very likely	27.2	20.2	25.6	25.7
Somewhat likely	39.7	42.1	40.9	44.1
Not too likely	28.1	29.8	25.0	21.7
Not at all likely	3.4	3.3	7.4	5.7
Unsure	1.6	4.5	1.1	2.9
Perceived seriousness of getting the flu				
Very serious	9.1	5.0	7.4	7.5
Somewhat serious	40.6	43.4	30.7	34.7
Not too serious	45.7	44.6	51.7	45.2
Not at all serious	3.9	6.6	9.1	10.2
Unsure	0.7	0.4	1.1	2.4
Perceived seriousness of getting a cold				
Very serious	4.3	2.1	4.9	3.5
Somewhat serious	27.6	16.1	25.7	15.0
Not too serious	48.9	56.2	48.9	50.9
Not at all serious	19.2	25.2	20.2	29.5
Unsure	0.0	0.4	0.3	1.1
Extent concerned about catching a cold				
Very concerned	18.0	7.5	15.9	11.5
Somewhat concerned	33.9	27.6	33.0	26.6
Not too Concerned	38.2	46.4	39.8	39.5
Not all concerned	9.7	18.0	10.8	21.9
Unsure	0.2	0.4	0.6	0.5

^a Percentages refer only to those who answered the question.

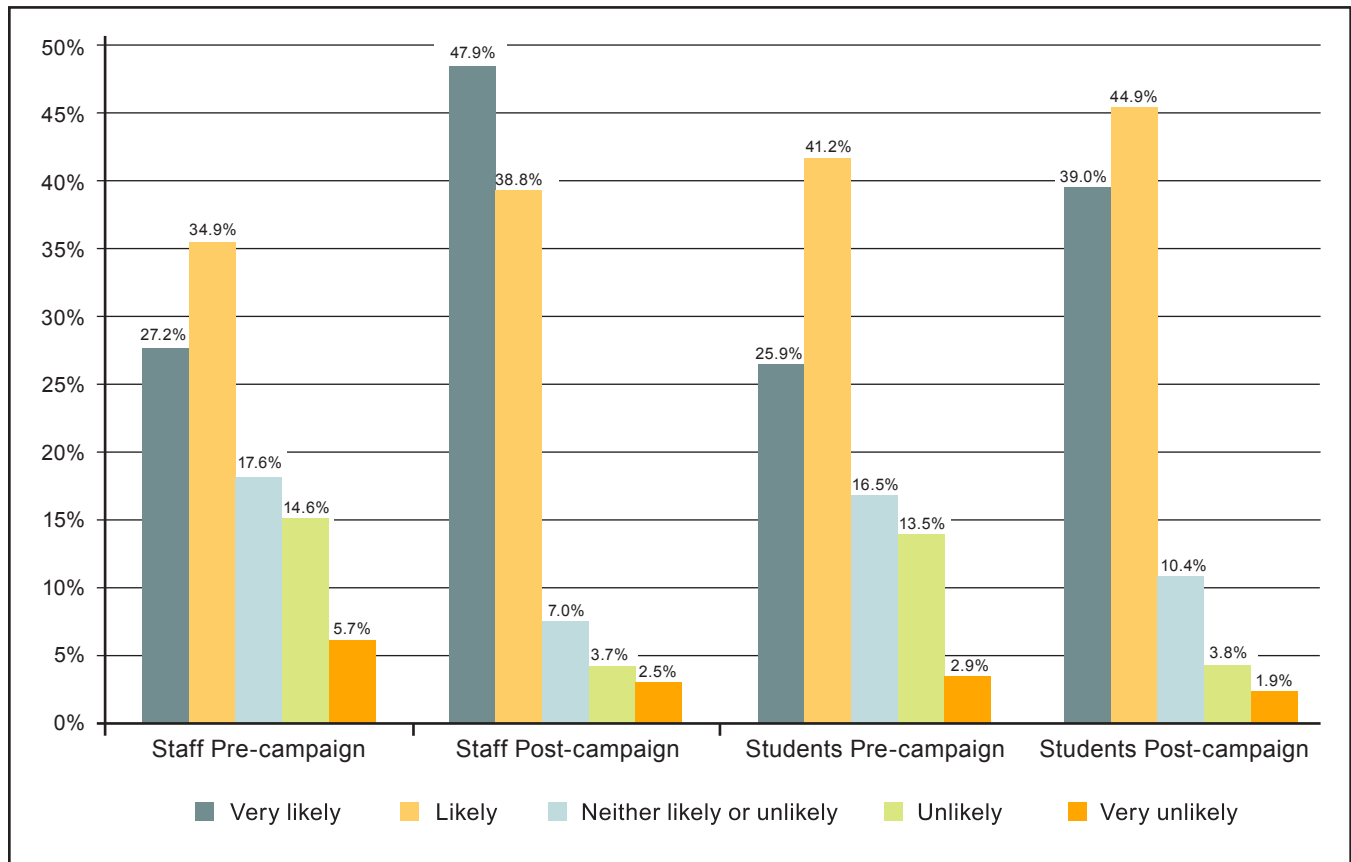
Table 3. Flu and Cold Prevention Knowledge, Attitudes, and Behaviors.^a

Variables	Staff		Students	
	Pre-campaign (n = 438)	Post-campaign (n = 242)	Pre-campaign (n = 231)	Post-campaign (n = 933)
	%	%	%	%
Agreed that strategies are likely/very likely to reduce the risk of catching a cold or flu				
Washing hands frequently	71.9	74.4	72.1	71.5
Coughing or sneezing into your sleeve	62.1	86.7	67.1	83.9
Staying at home when sick	94.1	92.1	87.1	89.4
Agreed that strategies are easy/very easy to do				
Washing hands frequently	88.6	89.7	75.2	82.6
Coughing or sneezing into your sleeve	82.2	87.2	92.9	93.1
Staying at home when sick	53.8	52.2	30.8	35.3
Engaged in these behaviors (past 3 months) ^b				
Washing hands frequently	--	86.8	--	83.3
Coughing or sneezing into your sleeve	--	68.9	--	49.6
Staying at home when sick	--	40.0	--	44.2

^a Percentages refer only to those who answered the question.

^b Reflects a response of "Yes," indicating they had done this in the past 3 months.

Figure 4. Student and Staff Ratings of the Likelihood that Coughing and Sneezing into a Sleeve will Reduce the Risk of Contracting or Spreading Colds and Flu.



campaign, as compared with those who did not, rated “coughing and sneezing into your sleeve” as being likely to reduce their risk of contracting or spreading colds and flu (88.0% vs 75.2% respectively; $\chi^2 = 48.5$, $df = 4$, $P < .001$).

The third recommended behavior in the campaign, “to stay at home if you are sick,” was high before and after the campaign. Most staff (94.1%) and students (87.1%) thought that this was “likely” or “very likely” to be an effective strategy before the campaign. Agreement for both staff (92.1%) and students (89.4%) remained high after the campaign.

Attitudes toward prevention behaviors. Most staff (88.6%), but fewer students (75.2%), felt that washing hands frequently was “easy” or “very easy” to do on campus pre-campaign; similar results were

found post-campaign for staff (89.7%) and students (82.6%). Staff were more likely to rate this behavior as “easy” or “very easy” to do while on campus than students at both time points, although the differences were not statistically significant. This may reflect the availability of a kitchen and close proximity to bathrooms in office facilities. Both students and staff also felt that “coughing and sneezing into your sleeve” would be “easy” or “very easy” to do while on campus in the pre-campaign survey (92.9% and 82.2% respectively; see Table 3). The proportions who agreed remained high after the campaign at 93.1% for students and 87.2% for staff. Ratings of how easy it would be to “stay at home if you were sick” were mixed both before and after the campaign. In general, staff were significantly more likely to rate it as “easy” or “very easy” to do than students both before (53.8% vs 30.8% respectively; $\chi^2 = 48.1$, $df =$

4, $P < .001$) and after the campaign (52.2% vs 35.3% respectively; $\chi^2 = 39.1$, $df = 4$, $P < .001$).

Prevention behaviors. On the post-campaign survey only, respondents were asked whether they had performed any of a list of behaviors in the last three months (ie, over the winter of 2011); the list included the three campaign target behaviors. This question was only included on the post-campaign survey because some of the behaviors were introduced to the target audience for the first time during the campaign. The two most commonly used behaviors by students were washing hands frequently (83.3%) and covering nose/mouth with a tissue (80.3%). The two most commonly used behaviors by staff were covering nose/mouth with a tissue (88.0%) and washing hands frequently (86.8%). Most staff (68.9%), and almost half of the students (49.6%), had used the cough and sneeze into your sleeve behavior within the prior three months. Most staff (67.4%) and students (61.2%) had also tried to avoid contact with people who were sick. Fewer staff (40.0%) and students (44.2%) had stayed at home when they were sick. The percentage of staff and students who engaged in the three target behaviors post-campaign was relatively comparable, except for the cough and sneeze into your sleeve behavior, where slightly more staff had done so.

Top 10 ranked prevention strategies. Both the pre- and post-campaign surveys asked respondents the following open-ended question to gauge behavior-based prevention strategies: “What steps could you take to reduce your risk of catching the flu or cold?” Respondents were able to list up to five behaviors; the most commonly reported behaviors by staff and students were washing hands, avoiding people who are sick, and eating a healthy diet (Table 4). These three strategies remained the top three strategies after the campaign.

The percentage increase for those who mentioned “washing hands” pre- to post-campaign was higher among students (a 51.3% increase) than staff (a

14.0% increase). The largest increase in the targeted behaviors for both staff and students was seen for “cover coughs.” Prior to the campaign, 13.0% of staff and 12.1% of students identified this as a behavior they could use to prevent getting a cold or flu. After the campaign, 20.7% of both staff and students reported that they could use this behavior, and the order shifted upwards from eighth to fifth most often mentioned for both; this reflects a percentage increase of over fifty percent for both staff (59.2%) and students (71.1%) from pre- to post-campaign. For staff, the “stay at home if you are sick” behavior was identified by 9.4% in the pre-campaign survey and rose substantially to 20.7% on the post-campaign survey (see Table 4). This reflects a percentage increase of 120.2% for staff and the order shifted from tenth to sixth most often mentioned. For students, the proportion of people who “avoided sick people” increased from 35.9% before the campaign to 47.4% after the campaign; a percentage increase of 32.0%. Slightly higher increases were seen among students for having a healthy diet as a preventative measure; a percentage increase of 48.3%.

Intervention Exposure and Message Recall

On the post-campaign survey, respondents were asked to recall whether they had seen any information about colds and flu or received/used any products with a cold and flu message at the University in the previous three months. On the unprompted recall question, the majority of students (70.3%) and staff (82.6%) had seen information, but only 17.4% of students and 35.1% of staff had received or used any products with a cold and flu message (Table 5). Overall, unprompted recall of campaign messages and products was higher for staff than students. Staff were significantly more likely than students to recall seeing any cold or flu messages ($\chi^2 = 14.8$, $df = 1$, $P < .001$) and to have received or used any products with a cold and flu message ($\chi^2 = 36.5$, $df = 1$, $P < .001$) on campus in the last few months. And, as

Table 4. Top 10 Staff and Student Behavioral Strategies to Prevent Catching the Flu or a Cold.^a

Prevention Behaviors	Staff				Students			
	Pre-Campaign (n = 438)		Post-Campaign (n = 242)		Pre-Campaign (n = 231)		Post-Campaign (n = 933)	
	Order No.	%	Order No.	%	Order No.	%	Order No.	%
Wash hands	1	67.8	1	77.3	1	47.2	1	71.4
Avoid sick people	2	57.8	2	54.5	2	35.9	2	47.4
Healthy diet	3	35.6	3	37.2	3	29.0	3	43.0
Flu vaccine	4	24.9	4	20.7	9	10.4	9	16.0
Keep warm	5	22.4	8	11.6	4	22.1	4	24.8
Take vitamins/supplements	6	19.9	10	9.5	6	12.6	7	16.4
Exercise	7	17.1	7	18.2	7	12.6	8	16.2
Cover coughs	8	13.0	5	20.7	8	12.1	5	20.7
Sleep/rest	9	12.3	9	11.6	5	13.4	6	17.4
Stay home if sick	10	9.4	6	20.7	--	--	--	--
Not sharing cups, food, etc	--	--	--	--	10	10.0	10	13.9

^a Respondents were asked an open-ended question pre- and post-campaign: "What steps could you take to reduce your risk of catching the flu or a cold?" They could list up to five prevention behaviors they thought would reduce their chances of catching the cold or flu.

Table 5. Unprompted and Prompted Message and Product Recall Post-Campaign for Staff and Students.^a

Recall	Staff Recall (n = 242)	Student Recall (n = 933)	Significance Level ^b
	%	%	P Value
Unprompted Recall			
Saw campaign messages	82.6	70.3	***
Received or used a product	35.1	17.4	***
Prompted Recall			
Saw campaign messages	84.3	74.4	**
Received or used a product	33.9	24.4	

^a Message recall refers to the specific messages that were used in the campaign such as "stay at home if sick." Product recall refers to the products used to promote the message such as the posters with the messages on them. The question asked whether they had seen messages or received/used a product during the "last few months."

^b Where * = $P < .05$; ** = $P < .01$; *** = $P < .001$.

would be expected, full-time status staff and students had significantly higher rates of unprompted recall of the campaign messages and products than part-time status staff and students ($\chi^2 = 83.3$, $df = 1$, $P < .001$). Also, staff and students located on campus had significantly higher rates of unprompted recall of the campaign messages and products than those off campus ($\chi^2 = 236.8$, $df = 1$, $P < .001$).

After the unprompted questions, respondents were asked whether they had seen the specific campaign messages and products. Prompted recall was also

high with 84.3% of staff and 74.4% of students reporting that they had seen one or more of the campaign messages (Table 5). In addition, approximately one-third of staff members (33.9%) and one-quarter of students (24.4%) had received or used any of the products. Prompted recall did not differ appreciably from unprompted recall; it was only slightly higher than unprompted recall for both staff and students (see Table 5). This suggests that the messages were highly salient and well-targeted. Staff were again significantly more likely than students to recall campaign messages, but not

campaign products on prompted recall.

Table 6 presents the specific products that were recalled in response to the unprompted and prompted questions among those who indicated had seen information about colds or flu on the campus in the last few months. The majority of staff and students identified posters as a campaign strategy they had seen in their unprompted and prompted responses. Staff were significantly more likely than students to recall seeing the desktop hygiene center, the Web site, and the university TV on unprompted recall, but were less likely to recall the flu booths than students. Staff were similarly more likely than students to recall the

hygiene centre's on prompted recall, but students were more likely to recall the posters (including digital posters). The majority of students and staff who saw them, used the hygiene centers on one to five occasions (74.1% and 57.8% respectively); 5.8% of staff and 8.3% of students had used the centers 11 or more times. As shown in Table 6, students and staff had substantially greater prompted, than unprompted, recall of the digital posters, Web site, and UOWTV. Furthermore, student recall increased more than staff recall when prompted.

Table 6. Unprompted and Prompted Product Recall Post-Campaign for Exposed Staff and Students.^a

Products	Unprompted Recall			Prompted Recall		
	Staff (n = 242)	Students (n = 933)	Significance Level ^b	Staff (n = 242)	Students (n = 933)	Significance Level ^b
	%	%	P Value	%	%	P Value
Posters	60.7	54.4		76.9	93.1	***
Hygiene Centre	43.4	16.3	***	53.9	33.3	***
Flu Booth	2.9	11.5	***	11.3	16.1	
Merchandise	7.4	10.3		14.2	10.1	
Digital Posters	1.2	1.4		14.7	21.5	*
Web Site	2.1	0.2	***	24.5	27.8	
University of Wollongong TV	1.7	0.1	***	6.4	9.1	

^a Product recall refers to the specific products used to promote the campaign messages such as the posters or merchandise with the messages on them. Data presented reflect the percent of those who had seen campaign messages or received/used a product in the "last few months" post-campaign.

^b Where * = $P < .05$; ** = $P < .01$; *** = $P < .001$.

Discussion

This case study provides an example of how a social marketing campaign can be utilized to raise awareness of cold and flu prevention, and support attitudes and behaviors that could reduce viral transmission within a university campus community. Evaluation data suggested high unprompted

recall, and even higher prompted recall. The communications and other engagement activities appeared to promote changes in some targeted attitudes and beliefs, influenced student and staff recognition, and possible use, of several new cold and flu prevention strategies.

Specifically, the campaign appeared to reinforce the “wash your hands” behavior (as recognition was already high), and promoted discussion amongst students. There was an increase in the percent of staff, and a substantial percentage increase among students (51.3%), reporting they could use hand washing as a strategy to prevent colds and flu post-campaign. Results also add to current research findings by highlighting the potential value of using of gain-framed signage to promote the use of hand hygiene stations on university campuses, even in the absence of a flu pandemic.¹⁴ Results demonstrated an increase in the number of staff and students who recognized the importance of “coughing or sneezing into your sleeve” as an effective prevention strategy, as well as a substantial percentage increase among staff and students who reported they could use this new behavior (“cough and sneeze into your sleeve”) pre- to post-campaign. Furthermore, those exposed to the campaign, versus those who were not, were significantly more likely to rate coughing into your sleeve as an effective strategy post-campaign. The proportion of staff who reported they could use “stay at home if you are sick” as a prevention strategy increased by 120% pre- to post-campaign. The latter two findings are particularly notable given the existing social norms that are contrary to the promoted behaviors—the “soldier on” and come to work norm and the “ick factor” of coughing and sneezing into your sleeve (rather than the socially acceptable, but disease-transmitting alternative of “cover your mouth with your hand”).

Although there have been a number of college campus campaigns to prevent flu transmission, only one program reported in the literature has successfully increased demonstrably effective flu and cold prevention behaviors such as hand washing and sanitizer use in campus residence halls.¹¹ A second study reported on a campus-wide campaign to promote flu prevention behaviors and uptake of the H1N1 shot.¹² This is the first study, to our knowledge, that both attempted to support prevention behaviors in other campus environments

(eg, libraries, food eating areas, lecture theatres, etc)—not just within residence halls—and focused on promoting the adoption of a new behavior (“cough and sneeze into your sleeve”).

Key to the success of this intervention was the application of consumer insight to prompt the use of multiple strategies to address the traditional 4P’s of the marketing mix rather than a single-strategy communication campaign. This was evident particularly in the outreach activities that provided cues to action to perform the desired behaviors in numerous campus settings. The practical barriers to performing those behaviors were overcome by providing access to the required equipment (eg, the hygiene stations providing tissues and hand sanitizer). Secondly, whilst social marketing is an approach informed by diverse areas, its application in this project, which used a health promotion “settings” based approach,¹⁵ rather than a population-based approach, may have been another factor that influenced the high levels of awareness and exposure to campaign messages and resources post-campaign. Promoting messages and products through multiple venues on a single university campus may have helped support and reinforce potential changes in knowledge, attitudes, and behaviors among both staff and students. These changes are sometimes difficult to achieve in community or population-based campaigns.

Overall, this program was conducted on a modest budget (less than \$20K Australian) using the expertise of the University’s own Health Research Centre (with specialists in Social Marketing) and the extensive relationships and marketing channels previously established to provide good reach to the student and staff target audiences at a relatively low cost. The expenditures required to achieve a similar level of exposure in a community-based, rather than a setting-based, campaign is estimated to be at least four times this amount (ie, if purchasing “mass media” time). When we then add the potential cost savings from improved productivity due to

the decreased spread of cold and flu viruses, then this project again appears to provide excellent cost benefits and savings to the University administration. Whilst no formal economic studies were conducted at an institutional level, the University was sufficiently pleased with the success of the program at the time to have recommitted to funding a second intervention the following year.

Limitations

These encouraging results were achieved despite several limitations inherent in the pilot project. With regards to impact and outcome measures, behaviors were measured via the collection of self-report data, rather than the collection of more rigorous observational data. The pre- to post-campaign questions related to flu prevention behaviors were asked in a generic fashion (ie, “what steps could you take”), rather than being presented in a behavior and time-specific one (ie, what steps did you take in the past 3 months). Statistical comparisons were only conducted between staff and students either pre- or post-campaign (not pre- to post-campaign). All of these factors further limited what can be said with assuredness about the results. In addition, neither the impact of the intervention on the incidence of cold and flu symptoms on campus nor the days absent from study or work were monitored.

As such, while the campaign appears to have influenced self-reported behavior, the impact on actual prevention behaviors and ultimately on transmission cannot be established. The pre- to post-evaluation design used two cross-sectional surveys and no comparison schools. This is not considered the most rigorous of research methods to establish evidence of behavior change following the introduction of an intervention. Future studies should look to the conduct of randomized-controlled trials and the monitoring of matched longitudinal cohort data over time to establish the real power of the intervention effect and to compare statistically pre- and post-intervention results.

The campaign also did not target the uptake of flu vaccinations by staff or students. As a result, it does not add to the evidence in relation to this important prevention behavior as has been done in previous university campaigns.¹² This was not attempted due to the campaign timing (ie, it was commissioned by the university and implemented within a short time frame in which vaccination would be less effective). Additionally, the survey did not ask respondents whether they had been exposed to any other cold and flu interventions and there was no control group. Therefore, any differences in knowledge, attitudes, and behaviors observed from pre- to post-campaign may also be a result of the impact of other interventions. Finally, this campaign did not explore the impact of the campaign on students from various cultural backgrounds or assess the potential need for specific targeting of messages to different ethnic groups to increase uptake of recommendations.

Implications for Practice and Research

The findings suggest that the campaign was effective in reaching the target populations and in providing relevant, memorable, and useful messages and prevention strategies. The UOW Cold and Flu Campaign appeared to be effective in reinforcing the “wash your hands” behavior (particularly for students), influencing recognition of a new behavior (“cough and sneeze into your sleeve”) for both staff and students, and hopefully promoted further discussions among staff about staying at home when they are sick. Future campaigns could explore the need for and differential impact of targeting discrete market segments based upon student cultural backgrounds.

To build upon the success of this project, future programs should seek to implement multiple strategies as part of the marketing mix to not only promote, but also to support the desired prevention behaviors. Providing hygiene centers and products for individuals (eg, tissues) were promising augmented products that should be included within

an effective marketing mix. Future campaigns could also look to incorporate other prevention messages and environmental interventions (eg, routine provision of hand sanitizer) to support behaviors such as uptake of flu vaccination.

Policy makers and practitioners could also build on the lessons learned from this project by acknowledging that a critical component in the success of social marketing campaigns is sustained messaging.¹⁶ Ideally, the core behavior change strategies within a program should be promoted consistently on campuses with “fresh” executions to prevent wear-out and ensure sustained attention from the target audiences. The need for ongoing interventions is even more apparent in a university environment where there is an influx of new community members each year. As a result, universities should look to conducting campaigns on an annual basis to capture new audiences, prevent wear-out among others, and time their efforts with the start of the influenza season.

In addition, there are substantial implications and the need for future programs to work to promote policy changes within the University environment; policy is an additional “P” in what some may consider a more contemporary marketing mix.¹⁷ Specifically, university-based programs should consider the workplace policies and procedures that may be required in order to create environments where workers are aware of workplace rights and

provisions, and feel comfortable and supported to “stay at home” when they are sick. The distribution and maintenance of hygiene centers as part of routine university practices across departments could also be explored as a policy level measure. In addition, policies and procedures to support the routine collection of surveillance data to monitor cold and flu incidence and prevalence among staff and students over time would also be useful. This type of data would be helpful in monitoring the impact of colds and flu on work productivity and student outcomes. Such information would assist in the evaluation of the success of any ongoing or future interventions, enable assessments of the cost-benefits of such efforts, and the contribution of health promotion initiatives to the health and well-being of the staff and students on campus.

Conclusions

The transmission of colds and influenza presents a serious public health issue for universities, schools and other closed communities. This case study demonstrates how a coordinated social marketing campaign can be utilized to promote behaviors associated with reduced transmission of colds and influenza on a university campus. Key to the success of this intervention was the application of consumer research to prompt the use of multiple marketing messages and product strategies, rather than a single-strategy communications or social advertising campaign.

Acknowledgements

Funding/Support: This project was funded by an internal grant from the Office of the Vice-Chancellor, University of Wollongong.

Additional Contributions: The authors wish to acknowledge Ms. Jessica Iannella and Mr. Joshua Beard for their contribution to this project.

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