



UNIVERSITY OF WISCONSIN SYSTEM
SOLID WASTE RESEARCH PROGRAM
Undergraduate Project Report

Teaching Recycling:

The Relationship between Education and Behavior among College
Freshmen and its Effect on Campus Recycling Rates

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Abstract

Several campuses have determined that their recycling resources aren't being used efficiently. Students are often confused about what and how to recycle, resulting in either poor recycling behavior or refusal to recycle all together. Consequently, recycling education programs have been used to increase recycling rates. The University of Wisconsin-Stout has a unique opportunity to test the effectiveness of recycling education because there is a Freshman Orientation initiative. This allows for a targeted recycling education program. An experiment was designed to test the hypothesis that freshmen who participate in the recycling workshop during orientation week will have higher recycling rates than freshmen who do not participate in the workshop. Two freshmen residence halls of similar population size were observed, one control and one experimental. During the first week of the fall 2007 semester, more than 250 college freshman from the experimental group attended a 20 minute workshop to learn why recycling is important and how to do it properly. The control group did not receive the training. After the workshop, weekly recycling data were collected at both sites for the entire semester. A pre- and post-experiment recycling attitudes survey was also administered to students living within the experimental and control residence halls. The data from this research suggests that recycling education results in increased recycling rates among college freshmen. Survey results provided important feedback that can be used to help other campuses develop or refine their recycling education programs to increase the recycling rate of student populations.

Introduction

To promote recycling and waste reduction, the University of Wisconsin-Stout participated in the national RecycleMania college campus recycling competition for the first time in 2007 (January to April). Although the university placed well among other Wisconsin schools, organizers realized that a real need existed to educate the student community about the importance and methods of recycling at UW-Stout.

Several campuses have determined that their recycling resources aren't being used efficiently. Dalhousie University conducted a study using a survey and observations to determine the efficiency of recycling on their campus (Brooks, et al. 2006)¹. The survey revealed that students knew about the recycling program on campus, but felt uneducated or confused about the types of items that could be recycled and the specific steps to take for recycling. As a result, they often threw recyclables in the trash bins or in the wrong recycling bins. Similar observations have been reported at other college campuses (Florida State University, 2004 and Bator, 2001)^{2,3}. Vining and Ebreo (1990)⁴ found that the major difference between recyclers and non-recyclers was their knowledge of which materials to collect for recycling. To address this problem, recycling education programs are being used as a tool to increase recycling rates. In most cases, these programs are not very targeted so it is difficult to determine if the educational programs are directly responsible for the increased recycling (Florida State University, 2004)².

Because the University of Wisconsin-Stout has a Freshman Orientation initiative, a unique opportunity existed to test the effectiveness of recycling education on recycling rates. Working with University Housing, I was able to establish experimental and control student groups to determine whether a recycling education workshop targeting incoming freshman would result in an increase in recycling rates.

Methods

Workshop

Two residence halls of similar size and class were observed. Curran-Kranzusch-Tustison-Oetting (CKTO) Halls were the control population and Hansen-Keith-Milnes-Chinnock (HKMC) Halls were the experimental population. Each hall housed about 450 first-year freshmen. Of the 450 students invited to the workshop, 264 attended. Students from the experimental hall participated in the 20 minute workshop on Monday September 3, 2007 but students from the control hall were not invited.

When students arrived, they completed a pre-workshop survey (*discussed in detail later in this section*). They were also asked to participate in a “Price is Right” activity. During this activity students were tested on their existing recycling knowledge. They were asked to pull an item out of a box and place it into the correct bin. Items included trash and recyclables such as aluminum, tin, glass, plastic, and paper.

A PowerPoint presentation titled “Don’t Be Trashy, RECYCLE” was developed to teach recycling and encourage good recycling behavior. Issues such as over-consumption and pollution were discussed to showcase the importance of recycling. Students also received information about how to recycle successfully at Stout. The “Price is Right” activity and the pictures in the presentation illustrated which items were recyclable and where the recycling facilities existed on campus.

The workshop was designed to approach recycling from many different standpoints. Not everyone cares about the environment, so the workshop focused on several aspects of recycling that might influence positive recycling behavior. Recycling was presented from different

perspectives including economic, social, patriotic, environmental, health, and a hope for the future.

Resources

Posters promoting recycling and waste reduction were displayed on each floor of the experimental dorm. Each dorm room in the experimental hall received an informational door hanger and refrigerator magnet as well. These materials contained quick references for determining which materials are/are not recyclable. In addition, they contained my contact information and the Dunn County Solid Waste website. Each of these recycling advertisements, along with the workshop, showcased the “Stout Recycles” logo (Figure 1), which I created to demonstrate that Stout really cares about recycling and the environment.



Figure 1: Stout Recycles logo

Surveys

Pre- and post-workshop surveys were conducted to determine the recycling attitudes of students. We wanted to assess what students knew about recycling and their environmental and recycling attitude “pre” workshop. Near the end of the experiment, a “post” workshop survey was administered to determine if the workshop had a long-lasting effect on recycling attitude and behavior. The staff members from each residence hall were also surveyed to determine their potential impact on student recycling behavior.

Facebook Group

The majority of college students have a Facebook account and since UW-Stout is a laptop campus, it was a strong resource for this research. Upon completion of the workshop, students were invited to a Facebook group called “Don’t Be Trashy, Recycle” and about 250 students from the experimental hall joined the group. This approach was unique because it put information at the fingertips of the students in a form that they are familiar with and comfortable accessing. This allowed students to interact with each other as well as with me. The group consisted of announcements with recycling information and recycling statistics between halls. Students from the control hall were not invited to the group.

Data Collection

To determine if participation in the workshop improved recycling, solid waste data was collected from the control (CKTO) and experimental (HKMC) residential halls throughout the fall semester, starting immediately after the workshop to the end of the semester (September 3, 2007 to December 21, 2007). Weights were estimated each week for recyclables including plastic, glass, tin, aluminum, and paper (Figure 2).



Figure 2: Collecting recycling data.

Results and Discussion

Prior to participating in the workshop, students from the experimental group were asked to complete a survey about their recycling attitudes. They were asked what they would do if they were drinking a pop and finished it while walking down the street. Most indicated they would throw the recyclable in the nearest garbage can, a few indicated they would throw the recyclable on the ground, and some said they would keep it until they found a recycling bin. This survey question indicates there is a need for recycling education among Stout students. It also points out that convenience plays a large role in recycling behavior (Figure 3).

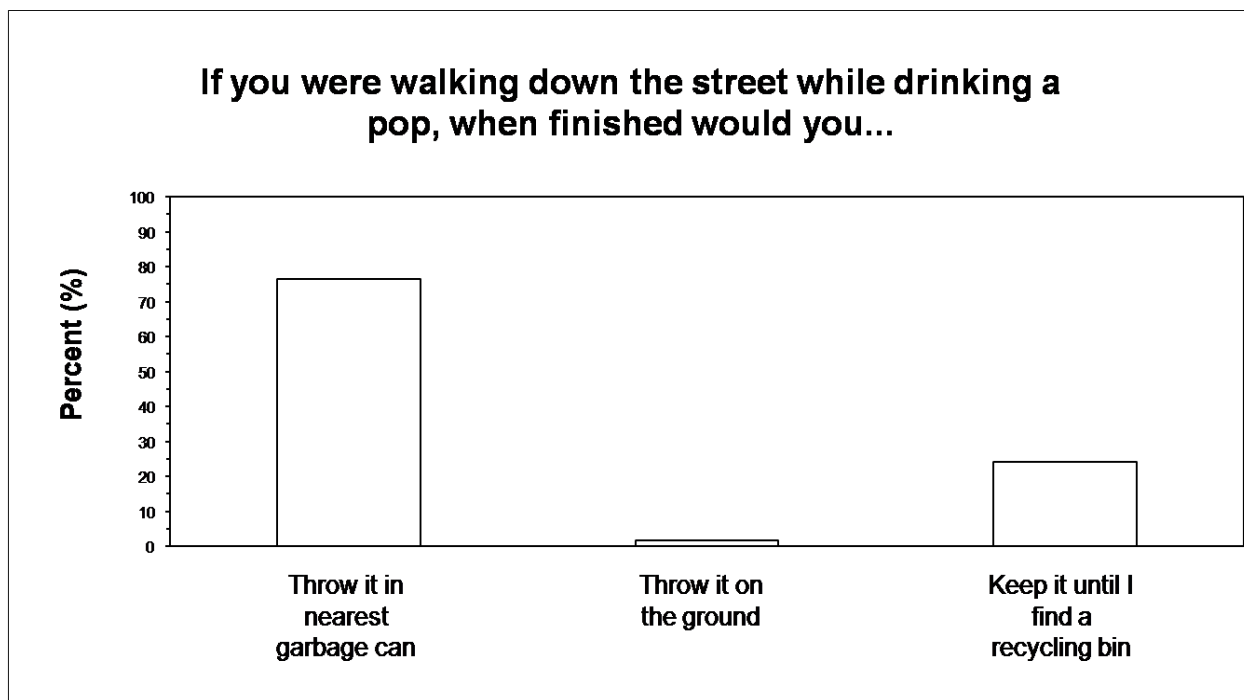


Figure 3. Pre-workshop survey results.

Students learned how to properly recycle immediately after attending the workshop (Figure 4). They became more efficient recyclers because they developed a habit of recycling immediately upon entering college instead of developing poor habits that are more difficult to

change. The recycling rates of plastic, tin, aluminum, and paper revealed a significant difference; however, glass data was not significantly difference between the two halls. Throughout the experiment, glass and aluminum alcohol containers were found hidden in bags or thrown into the trash. None of the students from either group were of legal drinking age and many opted to throw alcohol containers into the trash to avoid being caught; I believe this contributed to the low glass recycling rates.

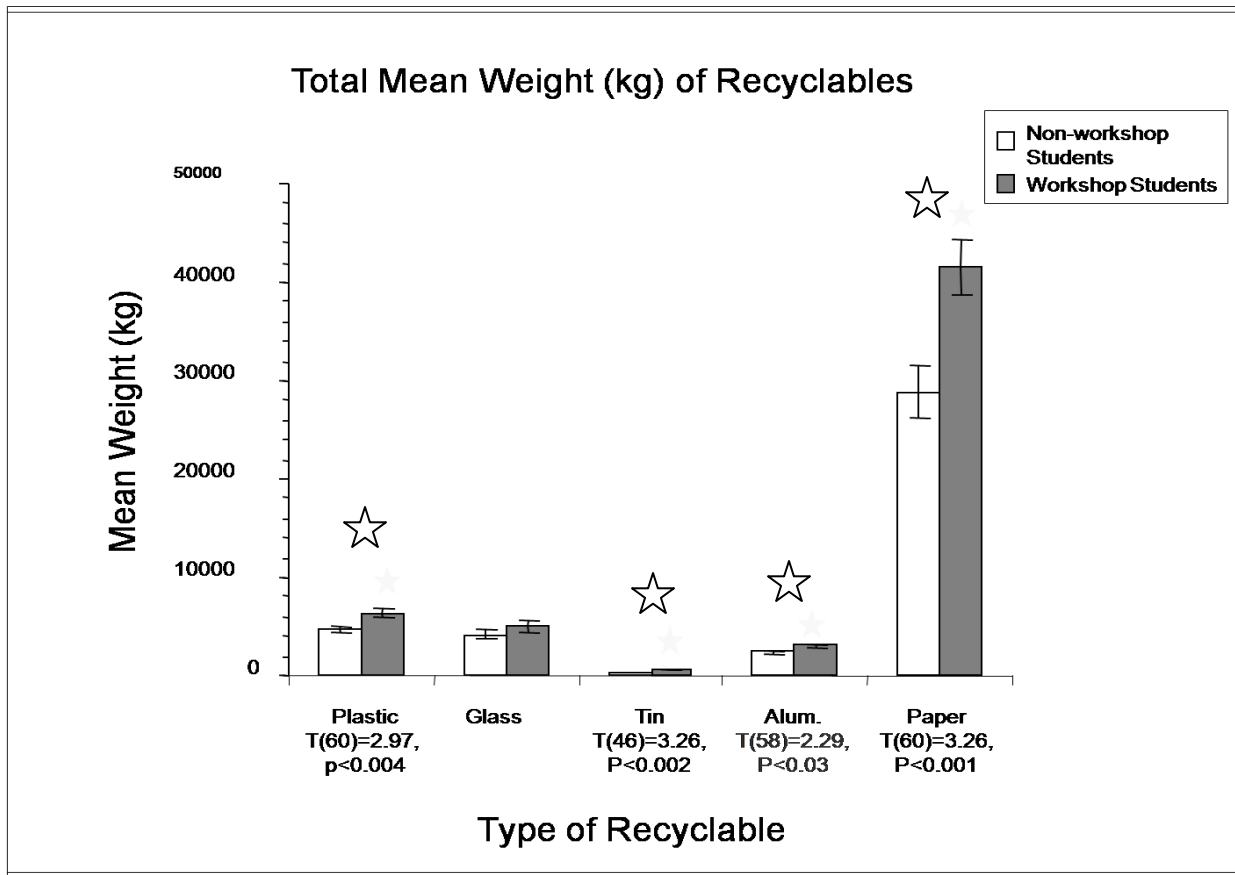


Figure 4. Total mean weights of all recyclables recorded for the non-workshop and workshop residence halls.

☆ = indicates a significant difference

A significantly higher rate of recycling in the experimental residence hall during the month of September suggests that the workshop made a difference. Students who didn't attend the workshop may not have been sure where, how, or what to recycle and recycled less as a result. A post-workshop survey was implemented in December which most likely reminded the students to recycle more, explaining the significant difference at the end of the experiment. Several students from the non-workshop hall took the course "BIO 111: Science, Society, and the Environment" where students learned about recycling and the environment. Of the two halls, 85% of the students who took the course were from the non-workshop hall. This may explain why the non-workshop students learned and became better recyclers over time (Figure 5).

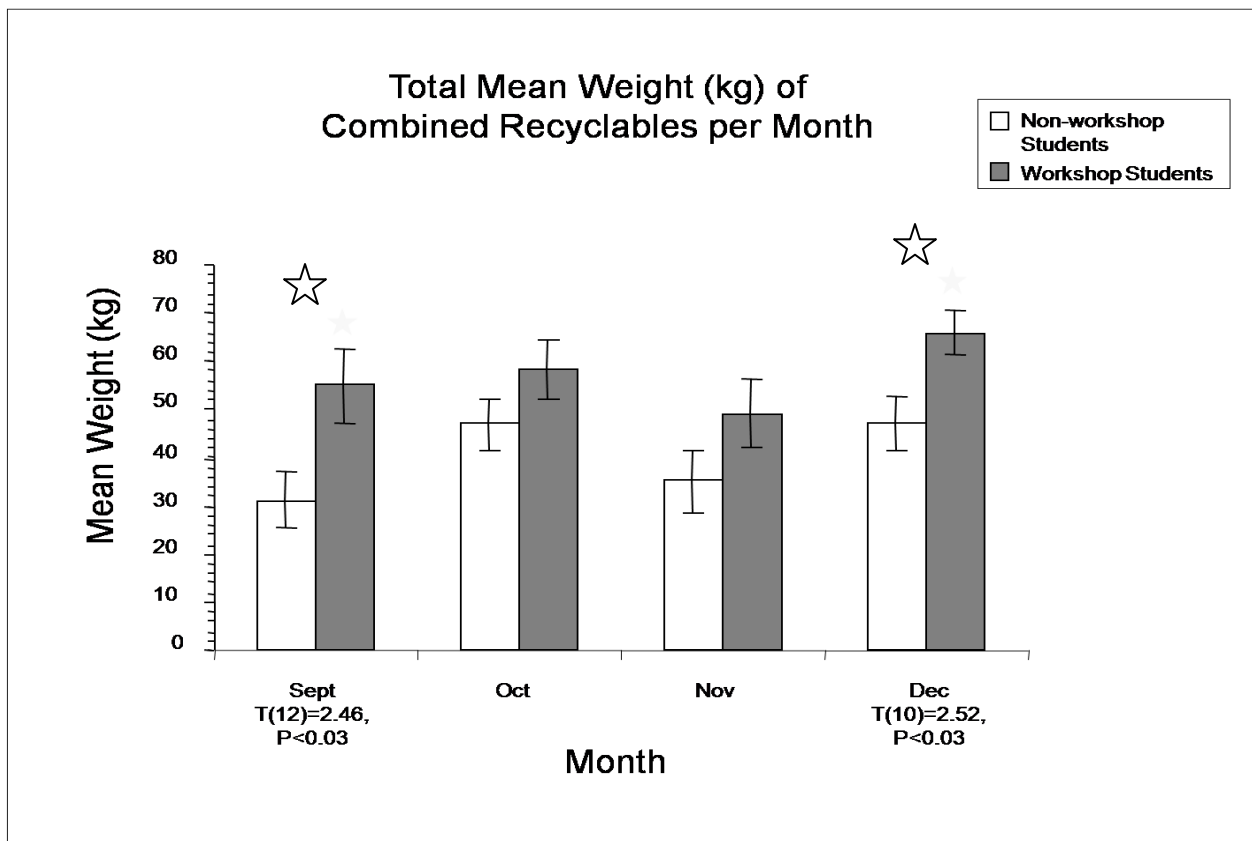


Figure 5. Total mean weights of combined recyclables per month.

★ = indicates significant difference

Workshop students recycled significantly more plastic during September, immediately following the workshop. During October, November, and December there was not a significant difference. It appears as though the non-workshop students learned more about recycling over time which closed the gap between recycling rates (Figure 6).

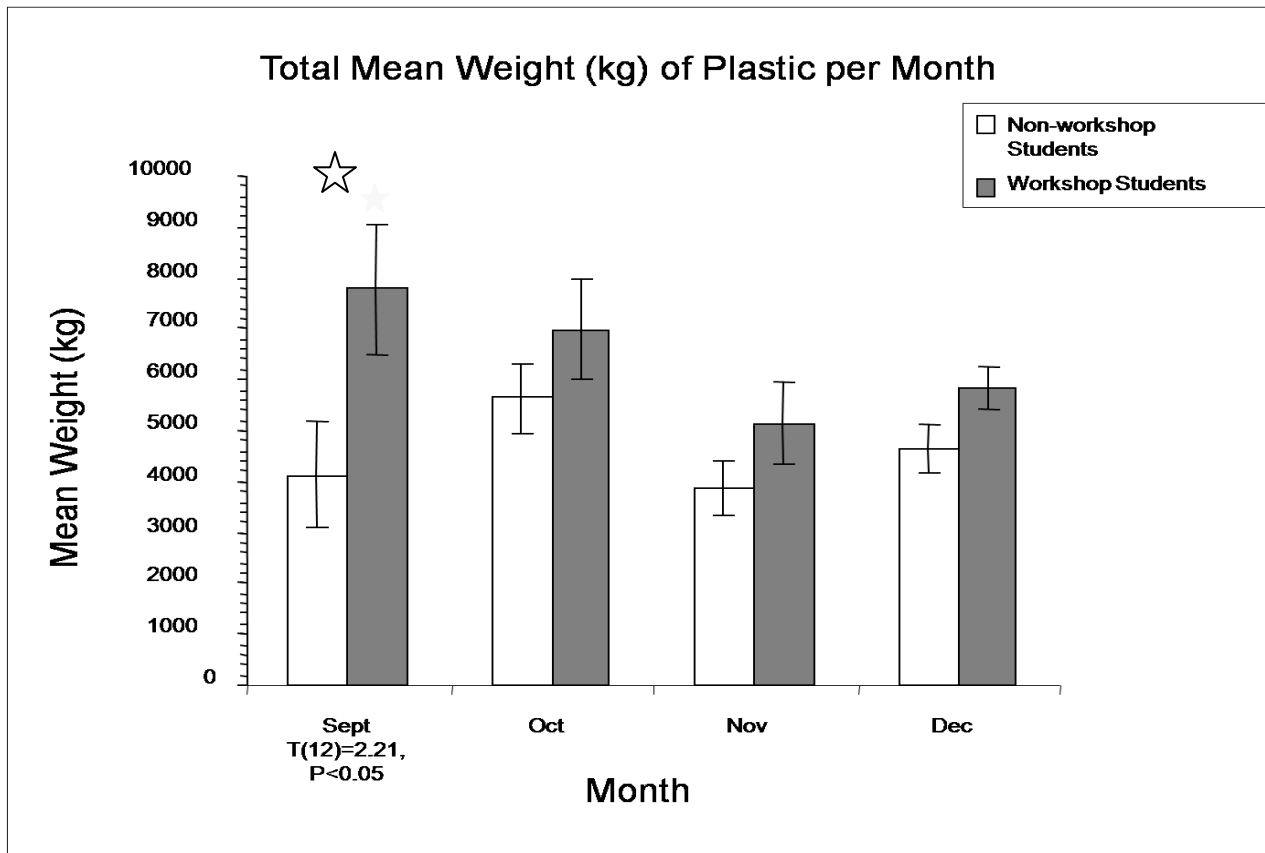


Figure 6. Total mean weight of plastic per month.

☆ = indicates a significant difference

The workshop students recycled significantly more paper during September but there was not a significant difference during October, November, and December. Similar to plastic, workshop students recycled more immediately following the workshop and the non-workshop slowly closed the gap in recycling rates (Figure 7).

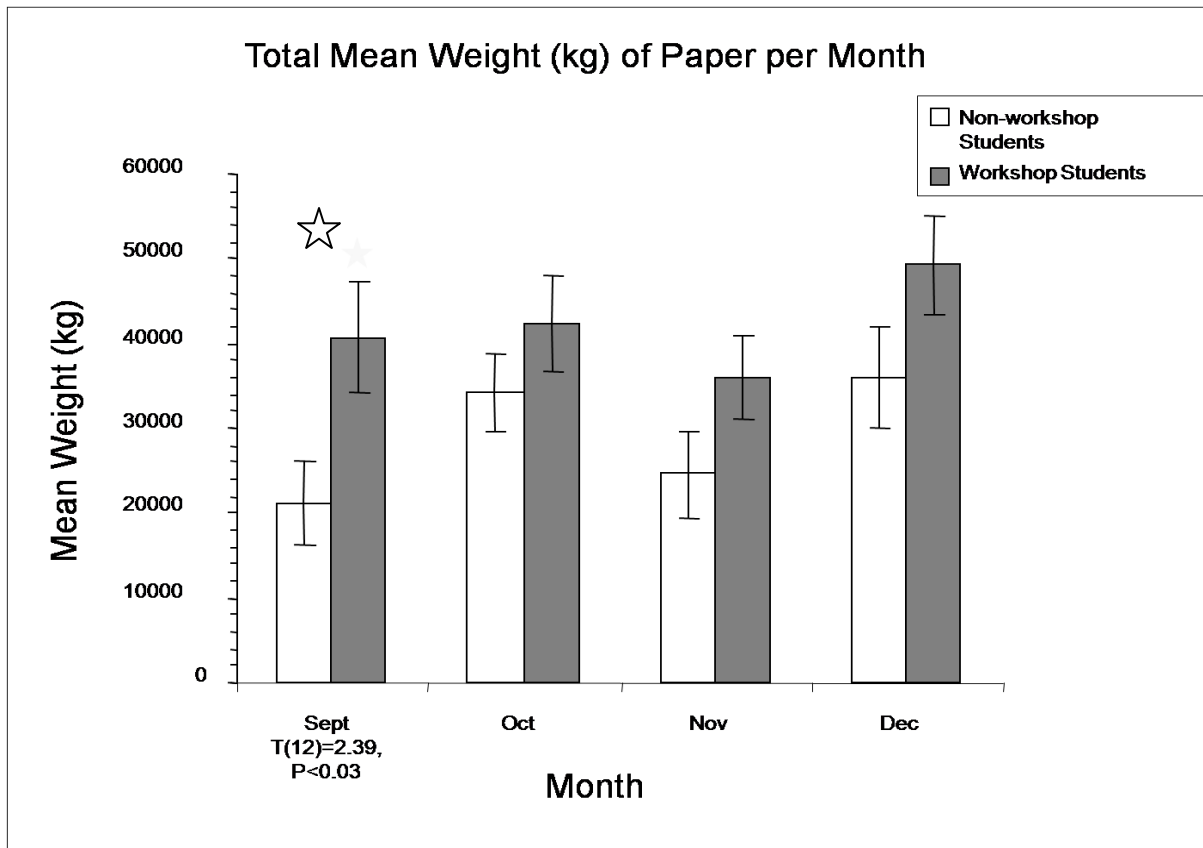


Figure 7. Total mean weight of paper per month.

☆ = indicates a significant difference

Workshop students recycled significantly more tin during the beginning of the experiment in October. In December there was a lot of variance so there was not a significant difference although the workshop students appeared to have recycled a lot more (Figure 8).

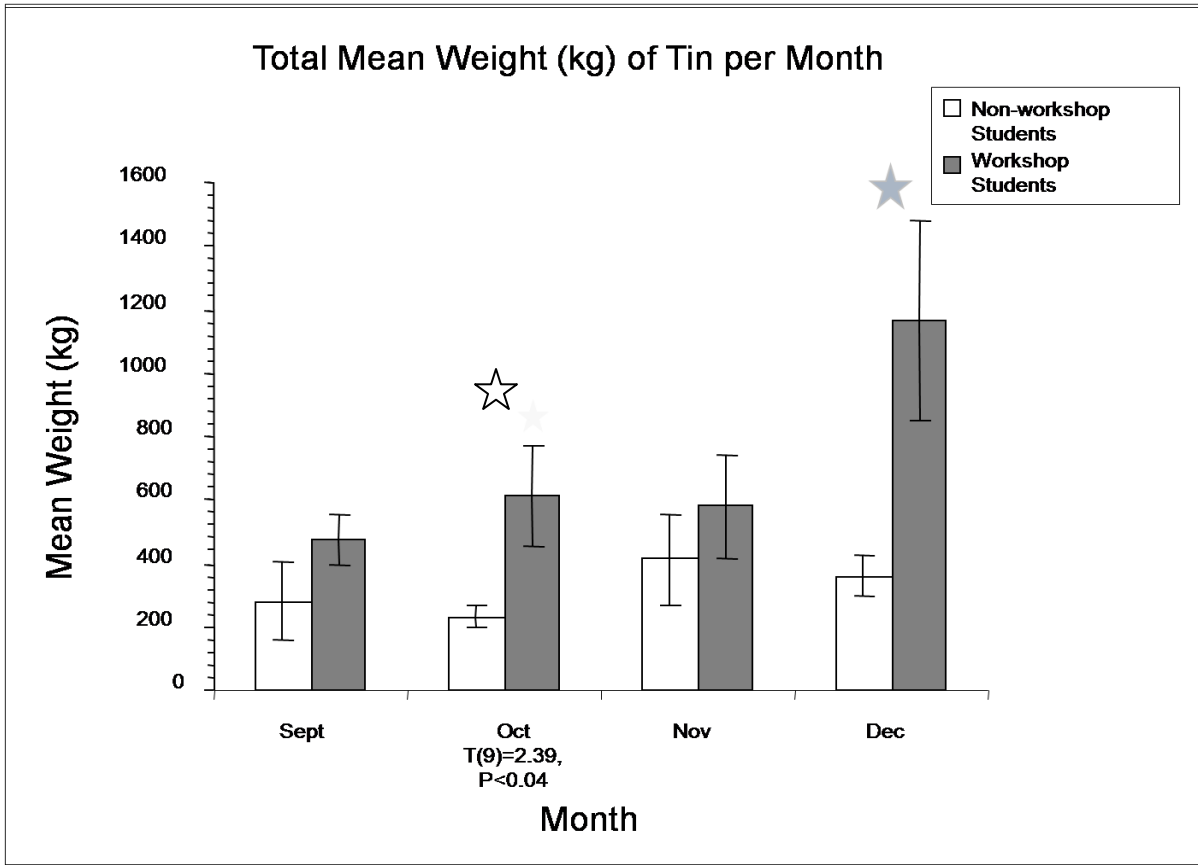


Figure 8. Total mean weight of tin per month.

☆ = indicates a significant difference

Although aluminum was significant overall, there was not a significant difference in aluminum month by month (Figure 9). Often, aluminum recyclables containing alcohol were thrown into the trash versus recycled (as explained in Figure 4).

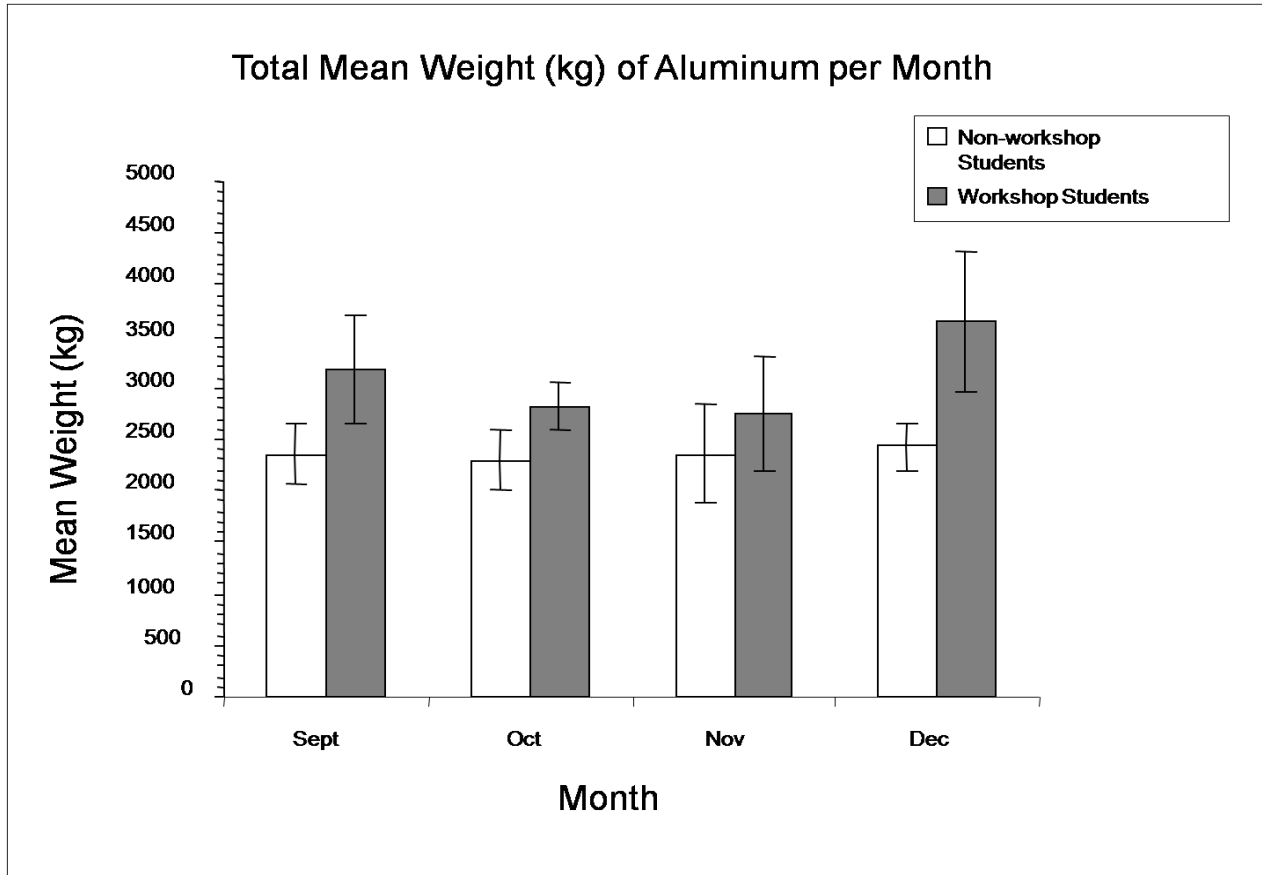


Figure 9. Total mean weight of aluminum per month.

There was not a significant difference in glass overall or per month (Figure 10). Similarly to aluminum, glass is often associated with alcohol and students opt to throw those items into the trash versus recycling to avoid getting caught for underage alcohol consumption. Refer to explanation in Figure 4.

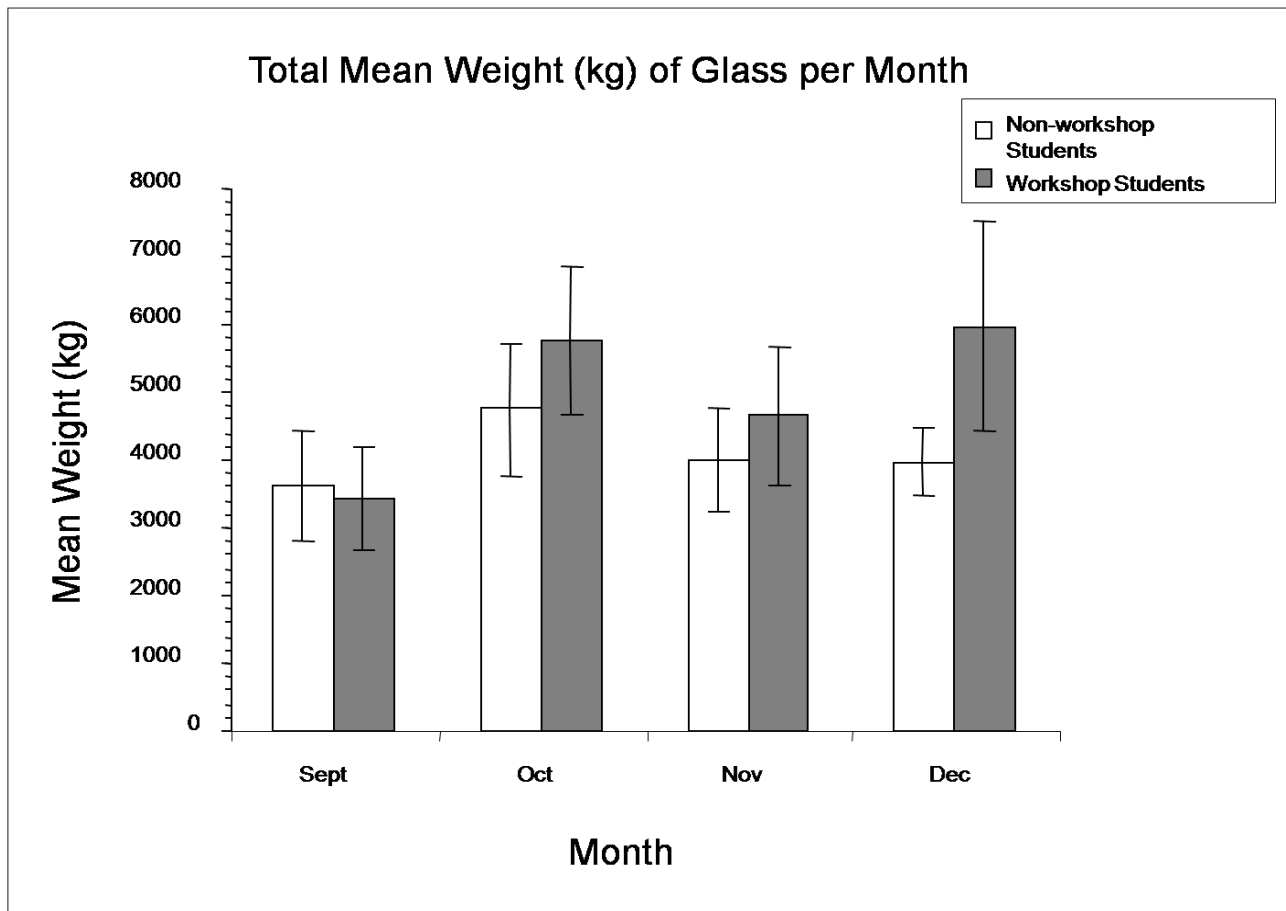


Figure 10. Total mean weight of glass per month.

A post-workshop survey indicates that students who attended the workshop learned more about recycling from their residence hall than students who did not attend the workshop (Figure 11). The workshop was a residence hall event so, according to the survey, students appeared to learn something from the workshop. When asked for any additional comments, students indicated that the biggest contribution to non-recycling behavior was inconvenience.

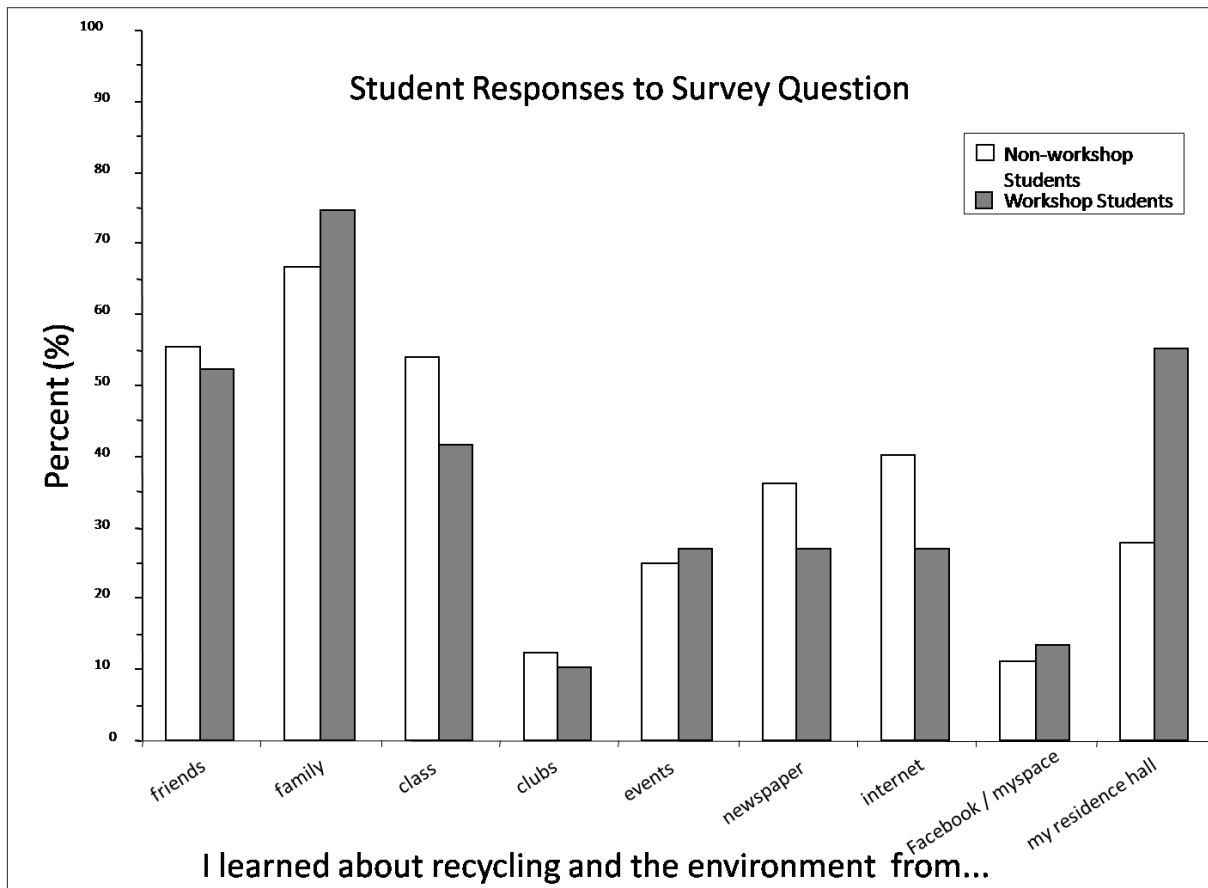


Figure 11. Students indicated how they learn about recycling and the environment.

There was a significant difference in the responses of workshop students who said they recycle more now than before they came to Stout (Figure 12). During the workshop, students were given information about the benefits of recycling and how-to instructions. The workshop may have encouraged students to recycle more because their newfound knowledge and confidence.

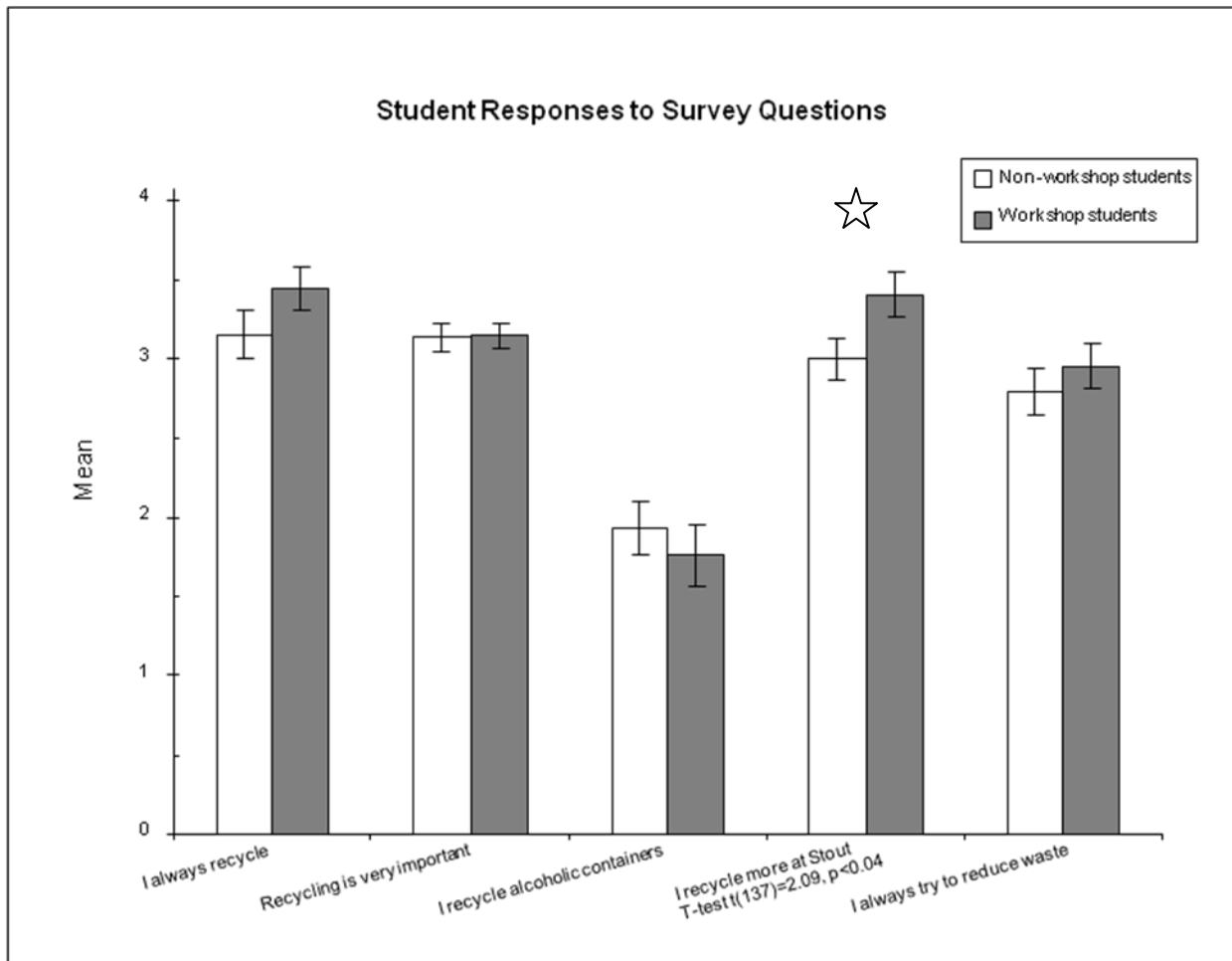


Figure 12. Students indicate their feelings and behaviors regarding recycling.

☆ = indicates a significant difference

Residence hall staff members were surveyed to determine their impact on student recycling behavior (Figure 13). There was not a significant difference between the halls which indicates that both groups seem to be environmentally aware. This tells us that Resident Advisors are getting the same information either from Resident Advisor training or their Hall Directors. Even with environmentally aware hall staff members the workshop appears to make a difference, especially in the beginning of the school year.

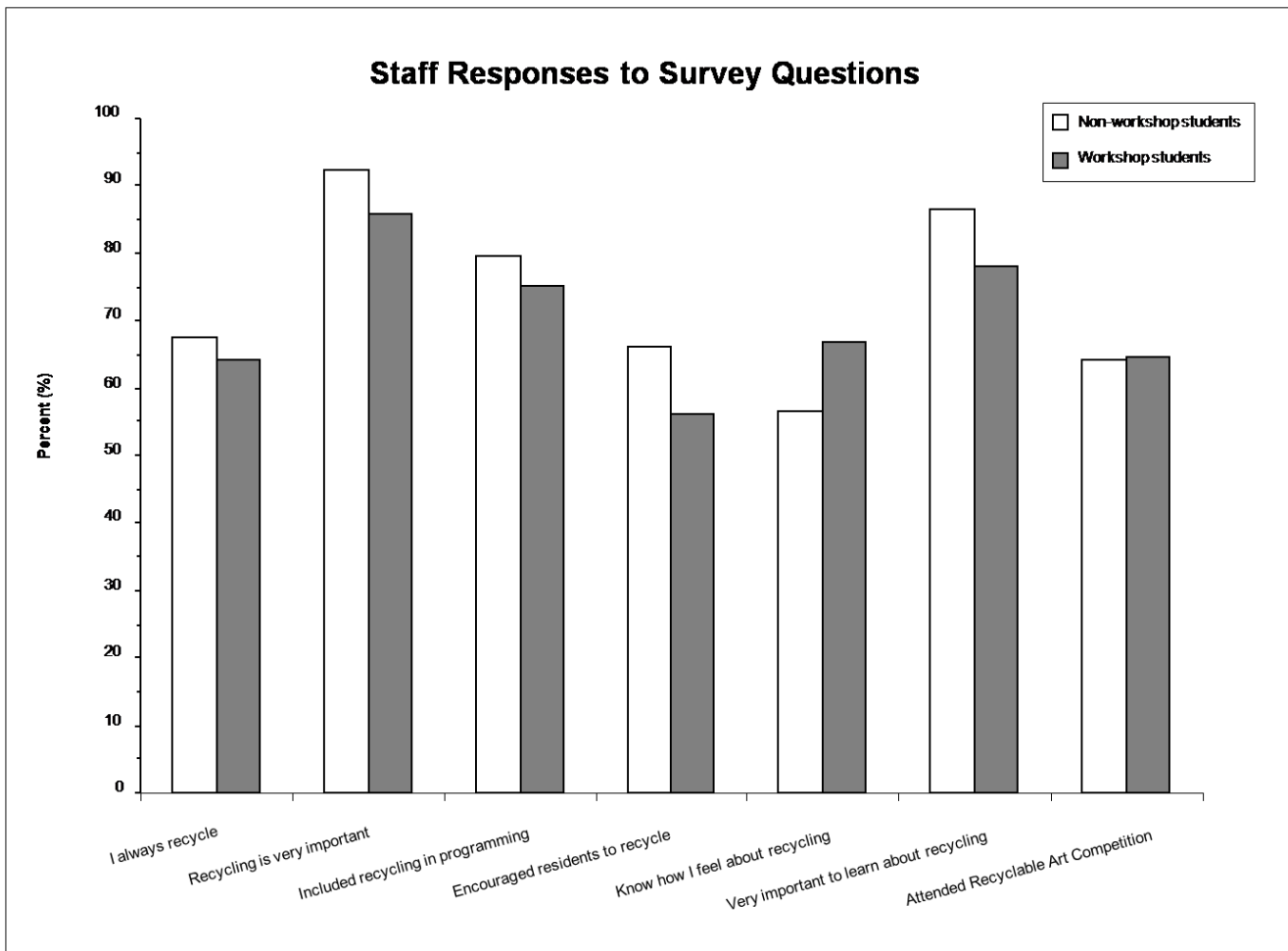


Figure 13. Residence hall staff responses to survey questions.

Conclusion

The data suggests that an educational recycling workshop increases the recycling rates among first-year college freshmen. Workshop students seem to begin recycling sooner and at a higher rate than students who do not attend the workshop. Students who attended the workshop left with knowledge, resources, and materials to help them become successful recyclers.

Non-workshop students appear to be learning about recycling and the environment from somewhere. They may be recycling more as time goes on because they discover the recycling facilities on their own, they may learn about the environment through classes (BIO 111: Science, Society, and the Environment), or they may recognize that recycling is a social norm among the Stout community.

Convenience plays a large role in recycling behavior of freshmen students for both the control and experimental groups. If recycling is not clear and convenient, many students may opt to throw recyclables in the trash. Also, if students consume alcoholic beverages, they are not likely to recycle the containers for fear of being caught for underage alcohol consumption.

There are several steps universities and organizations can take to increase recycling on their campuses. Students may recycle more if it is as convenient as possible. Bins should be clearly labeled and consistent throughout campus. If recyclables can be comingled it would encourage students to recycle more because they wouldn't have to take the time to sort their items. In addition, residence hall staff members play a large role in the development of individual accountability. They are a great resource for teaching recycling.

An educational workshop is a powerful tool to educate people about why recycling is important and make them more confident about recycling. The workshop is impactful because it helps foster a behavioral change by suggesting a positive attitude and moral responsibility.

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