

# Vending Machines: Comparing Convenient Qualities between Japan and America

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## **Abstract**

Although many of us see vending machines every day, we may not always think about them as an important part of our daily lives. In comparison to other countries the United States has the largest number of vending machines. However Japan has the highest density across both population and land mass, with roughly 1 vending machine for every 23 people. Post-war Japan took American machines and redesigned them to be practically perfect in every way. For my capstone, I will be comparing the role vending machines play in American and Japanese university students' daily lives. I will also examine students' perceptions of the convenience of vending machines and how they reflect upon their culture. I found that in while both Japanese and American students prefer to use cash, in the future Americans want to use other payment methods more. In respect to the functionality and interface design, Japanese designed vending machines were preferred.

## **Introduction**

Vending machines are an indispensable part of our daily lives. In Japan many vending machines sell items that are not sold in American vending machines. How are vending machines used in Japan and America, also what interface and payment methods are preferred. In this research the differences regarding vending machines between Japanese and American college students.

### **1. Significance of the Study**

While abroad in Japan vending machines were an important part of daily life. After returning to America I realized the inconvenience of American vending machines. Ultimately I wanted to investigate vending machine use and its culture to find similarities and differences between America and Japan.

### **2. Research Questions**

1. What role do vending machines play in Japanese and American students daily lives?

2. How do Japanese and American students use of vending machines reflect upon their culture such as the interface design and payment preference?

### **3. Research Background**

#### 3.1 History of Vending Machines

The world's first vending machine was invented in the first century by Hero of Alexandria. The weight of a coin would dispense holy water (Jaffe, 2006). In 1888 Thomas Adams first sold Tutti Frutti chewing gum from a vending machine. He placed them on train platforms to attract the most customers. This was America's first profitable vending machine (Sergrave, 2002). Japan's first vending machine was from 1904 and could sell both stamps and postcards. Now Japan has around 3.8 million vending machines and America has around 6.9 million vending machines. In 2014 Japan sold \$48 Billion in goods from vending machines. In 2013 America sold \$42.7 Billion in goods from vending machines. It is speculated that across land mass and population Japan has the highest density of vending machines in the world (Japan National Vending Machine Manufacturers Association, 2015).

#### 3.2 Types of Vending Machines

Japan has many more unique types of vending machines. Vending machines were essentially large refrigerators and could easily dispense many different types of drinks. Canned coffee was popular but could only be served cold until the 1972 debut of vending machines that could sell hot or cold drinks. Now they can sell both hot and cold items at time, even soups.

Since 2008 taspo (Tobacco Access Passport) cards are used to verify adults at vending machines and prevent underage smoking. Now 98% of Japanese tobacco vending machines use taspo. Taspo works using NFC (Near Field Communications) so there is no need to swipe, just touch the card to the reader (Tobacco Institute of Japan, 2015).

#### 3.3 Payment Method

Japanese currency consists of 7 types of coins (¥1; ¥5; ¥10; ¥20; ¥50; ¥100; ¥500) and 3 types of notes (¥1000; ¥5000; ¥10,000), while America only has 4 commonly circulated types of

coins (.01; .05; .10; .25) and 6 types of notes (\$1;\$10;\$20; \$50;\$100). One Japanese coin can have more value than one American coin.

A common method of cashless payment at vending machines is using NFC (Near Field Communications) a technology to replace swiping cards and enables cell phones to be used for payments. In 2001: East Japan Railway began using NFC based *Suica* cards to speed up the vending of train tickets; later it expanded to become electronic money card (JR East, 2015). The 2004 introduction of *Osaifu-keitai* let your mobile phone emulate select NFC cards such as credit cards or *Suica*. 37.5 million DOCOMO users, (65% of the total subscribers) own a NFC-compatible device (NTT Docomo, 2011).

To boost sales, vending machines that accept credit cards and NFC are being introduced (Kharif, 2013). For a comparison, the average cashless transaction of \$1.71 compared to the average cash transaction of \$1.16 (Vendscreen, 2013). Apple pay and Coca-Cola partner to offer NFC payments at 100,000 more vending machines by the end of 2015 (Moye, 2015). From January USA technologies enabled Apple Pay NFC payments at 200,000 existing machines (USA Technologies, 2015).

#### **4. The Study**

##### 4.1 Demographics

62 Japanese and American university students participated in the study. Consisting of 32 American and 30 Japanese respondents. There were 13 American male, and 19 female; as well as 13 Japanese male and 17 Female respondents.

##### 4.2 Research Method

English and Japanese online surveys were conducted through Google Forms.

#### **5. Research Findings**

5.1 Research Question 1: What role do vending machines play in Japanese and American students daily lives?

When asked what types of vending machines have you used, 50% or more students responded with the following answers. In Japan drinks, toys, snacks, and meals are commonly used. In America drinks, snacks, sweets, and DVD rentals are popular. Top 3 most used types of vending machines in daily life were similar for both Japanese and Americans with drinks and snacks at #1 and #2. For #3 Americans like to fill their sweet tooth while Japanese buy tickets.

When asked about the frequency of vending machine use 67% of Japanese use vending machines once a week or more, while 78% of Americans whom use vending machines once a month or less. On much you would ideally spend at a vending machine, the majority of Japanese students are willing to spend more on both soft drinks, and coffee or tea than Americans. When asked “I want the number of vending machines in my area to \_\_\_\_\_” 47% of Americans want more vending machines, while 73% of Japanese do not want the number to change. When asked if they agree to the following statements, “Vending machines are easy to use” Both groups agreed with 100% of Japanese and 96% of Americans. “Vending machines have a variety of products offered” Over 60% agreed to a wide variety of products across both American and Japanese students. “Vending machines are reliable dispensing their product” 80% of Japanese agreed that dispensing is reliable compared to Americans 59%. “Vending machines are reliable with cash” 80% of Japanese students agreed cash is reliable while Americans had only 50% agreement. “Vending machines are reliable with credit/debit cards” 43% of Japanese disagree cards are reliable compared to 22% of Americans.

“There is a vending machine outside of a shop and they both sell the same product you want. Which would you make a purchase from?” Japanese chose shops while americans chose vending machines. The top reason for Japanese students was Cheaper price, and the top 3 reasons for Americans were Faster, More Convenient, and No line.

### 5.1.1 Research Question 1 Summary

Japanese Students use vending machines at a higher rate than Americans, and Japanese students seem willing to pay more for a drink at a vending machine than Americans are. Japanese students gave vending machines a higher rate of reliability among all categories. Surprisingly

Americans view credit/debit cards as the most reliable. Finally The saying that people use machines to avoid human interaction may not be true for all.

5.2 Research Question 2: How do Japanese and American students use of vending machines reflect upon their culture such as the interface design and payment preference?

Currently cash is the most used for both Japanese and American students to pay at vending machines most often. Next I asked about future payment preference, and the majority of Japanese students still want to use cash in the future. However the majority Americans would like to use an alternative, with the majority wanting to use debit cards. Also interesting was the similar percentage of Japanese and Americans would like to use their Cell phones.

### 5.2.2 Research Question 2 Summary

Both groups use cash at vending machines most often but do not rely just on cash in their daily lives. While Japanese students found cash more convenient in their daily lives, Americans felt Credit and Debit cards to be as convenient as cash. Japanese students also felt comfortable carrying more cash than American students, and in the future Americans want to replace cash. Both groups found Japanese vending machines to be more visually appealing and functional. When asked about the frequency of carrying cash, 97% of Japanese always carry cash but only 38% of American always carry cash. In regards to how much cash students feel comfortable carrying, 75% Americans feel comfortable carrying a minimum \$5 or less, with 44% fine with nothing. 65% Americans feel comfortable carrying \$20-\$50 at most. In Japan 90% of students feel comfortable with a \$5-\$20 at least, and 76% of students feel comfortable with \$50-\$100 at most. The number of cards carried in a wallet that can be used instead of cash, the majority of Japanese and Americans responded carrying a substitute to cash on them with most students carrying 1-3 cards.

When surveyed about the convenience of payment methods the top three responses were, Americans thought Debit Cards most convenient with 97% agreement, while Japanese preferred cash 90% agreement. Both groups found credit cards to be the next convenient choice with 80% Japanese and 72% American agreement. Finally for number 3 56% of Japanese felt IC cards

were convenient while 72% of Americans felt cash was convenient. When asked about the convenience of using a mobile wallet the majority of students felt neutral or agreed about convenience, but they do not use them.

Comparing the following pictures of vending machines which were more visually appealing and functional. Japanese made machine A was favored by both Japanese and Americans. Japanese made machine C was favored by both Japanese and Americans. Finally Japanese made machine E was favored by both Japanese and Americans

## **6. Conclusion**

Japanese students use of Vending Machines are more frequently than Americans, but given a choice Japanese are more likely to buy from a human. Both Japanese and American college students have a fairly positive view about vending machines. Japanese vending machines are better to serve the customer not only reliably but visually and functionally. NFC was not widely used by the participants. Japan still has a strong cash culture among college students, and in the future, cash may still be most common for college students in Japan, but Americans may go cashless. Single coin vending may be a factor for Japanese to use vending machines more than Americans.

## **7. Limitations of the Study and Future Study**

Limitations of the study were the small sample size which consisted mainly of CSUMB and Okayama University students, and NFC infrastructure and IC cards are not widespread in America. For future study I would like to survey the convenience of carrying cash (weight vs value) and withdrawing cash (ATMs vs cash back); as well as comparing the vending machine use between rural and urban areas in Japan and America.

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