

# Effects of Leisure Policy on Consumer Satisfaction: Setting the Stage for Drone Proliferation

Hoonsuk Yoon

*Lawrenceville School, USA, hoonsukyoon@gmail.com*

**ABSTRACT:** As the government investment in UAV and drone technology increases, many aviation laws and legal limitations are impeding the growth of drone industry as a part of leisure activity. This research investigates the intricate interplay of leisure policy and people's perception to set the stage for the drone proliferation in Korea as a new public leisure activity. Using the data from Survey on National Leisure Activity collected by the Ministry of Culture, Sports and Tourism, 10,602 respondents whose age were 15 or older had participated in this survey. For this empirical research, an independent *t*-test, correlation analysis, and regression analysis were conducted. The result of our analysis has revealed that people who are in leisure club are more satisfied with leisure itself, but they are less likely to evaluate the leisure industry positively. When tested whether or not people's leisure policy perception affects the leisure satisfaction, how people perceive leisure policy and the leisure satisfaction affect their perception of leisure policy. This means that leisure policy should be fully taken into account when launching a new type of leisure activity. We can safely conclude that to make a sound policy and to increase public satisfaction, we must delve into the intricate interplay of leisure policy perception.

**KEYWORDS:** drone, leisure policy, accessibility, happiness, leisure industry

## 1. Introduction

Diminishing work hours and ensuing opportunity for leisure activity will promote sport-leisure activities (Kim & Kim, 2009). When looking at the Olympic games, more and more sports are incorporating technology into their operation. For instance, fencing athletes are now wearing electric jacket to raise the scoring precision (Alvarez, Cristobal, Gamalinda, Malino, & Miguel 2008). Using the replay systems to help referees make the right call is applied in many sports arena (Dyer 2015). Aside from Olympic sports, leisure like car racing rely almost entirely on the engineering success. In a similar vein, a promising technology like drone has entered into the leisure industry and is flocking a wide array of users across the world.

Drone was first developed for air force aircraft or missile exercise, but the public often sees that drone encompass all unmanned aerial vehicles (UAV) (Lee & Kang 2019). The drone market was estimated to be about \$25,100,000,000, will grow to be \$67,300,000,000 by 2020, and will be \$153,700,000,000 by 2025 (Kim 2017). Because of this upward trend, the Republic of Korea is investing large budget into the development and the proliferation of UAV (Kang 2017).

As we've just set foot in the fourth industrial revolution known for converging science and technological advances, the new concept of smart city has been proposed and is now being actively sought after (Townsend 2013). Many people, however, pose concern because the automated transportation and the use of drones in the smart city may generate an array of problems including privacy violation (Kim & Kim 2018; Lee & Kim 2017)

Indeed, drone will play a vital role in the smart, or future, city by transforming the transformation system and industrial mechanism (Petersen 2015; Lee 2015; Choi, Lee, & Li 2017). Because this smart city will be designed to promote public safety and life quality, the use of new technology is the center piece (Smith 2015). In this regard, drone technology is receiving attention throughout the world, and the government is endeavoring to expand the use of drone for agricultural, public, transportation, construction, disaster relief, environmental assessment, mass media, communication, aeronautic exploration and more (Kang 2017; Kim & Kim 2014; Lee & Kim 2017; Lee 2015).

Unfortunately, countries around the world are putting restriction on the use of drone technology. The likelihood of drone being used by terrorist and the drone threatening the public safety is limiting the proliferation of drone as a leisure medium. The Korean aviation law applies the same restriction on UAV as any conventional aerial vehicle (Ahn 2015).

As mentioned above, the Korean government is investing in the UAV, or drone technology. In 2015, a number of forums and policy hearing had been hosted by the government to modify aviation laws, certify drone pilots with legal credentials, and categorizing drones for leisure and business purposes (Ahn 2015). Such policy-making efforts are not bearing fruit yet because of aviation law and its restriction are still intact. One of the primary reasons that we can draw from these restrictions is because people cannot fly drone in city and its suburbs even. The contradiction that the government wants to promote drone industry but the public safety concerns is pressing down on its proliferation demands that we should investigate the intricate mechanism underlying leisure policy and leisure satisfaction. Despite this importance, little research had been conducted to unearth these complex relationships. Therefore, this research had been set out to lay an important foundation for technology-related leisure like drone to proliferate and take root as a leisure medium that would enrich the lives of many.

## **2. Literature Review**

### ***2.1 Definition of Drone***

Drone is defined to be an unmanned aerial vehicle (UAV), which is an aerial vehicle without pilot onboard (Kim & Kim 2018; Choi 2017). Drone has many names like Unmanned Aircraft System (UAS), Remotely Piloted Aircraft (RPA), Remotely Piloted Aircraft System (RPAS), or Autonomous Aircraft (AA) (Min & Park 2018). When used for military purposes and mount missile, weapons and warhead, drone is called Unmanned Combat Aerial Vehicle (UCAV). Some researchers argue drone does not include the ones used for military purposes (Ahn, Park & Yoo 2014). But hot air balloons, rocket, kite, vertical take-off and landing (VTOL) do not fall in the category of drone (Lee & Kang 2019). By declaring the ten-year roadmap for the technological innovation for the unmanned vehicle, the Ministry of Science and ICT began to invest in the six core technologies critical to unmanned vehicles: detection, recognition, communication, artificial intelligence, power source, transportation, and human (Lee & Kang 2019). Recently, the concept of unmanned vehicle has evolved to be a vehicle maneuverable autonomously or remotely, which means that it can automatically detect and move on its own (Kim et al. 2017). This means that drone technology is being studied and improved to achieve a complete automation to avoid crash, analyze imageries, and maneuver without human control. In the agricultural industry, unmanned automated machineries are widely being used, not to mention the drone application in marine or aeronautic purposes (Lee 2016; Kang, Jung, & Hwang 2018; Kim et al. 2017).

### ***2.2 Drone Policy***

Because drone technology has been born out of military environment, drone-related laws and policy are deeply nested in the context pertaining to military ecology (Lee & Kang 2019). Also, different definitions and cultural perception about drone makes it hard to come up with sound policy to regulate the drone industry. With further endeavor to minimize the potential dangers of drone, the concept of drone must take root in civilian context. Cities are meant for humans, and drones are being developed to make human life more convenient and safer, we should revise the concept (Lee & Kang 2019). As the expansion of drone industry is already well on its way, the drone proliferation, which will be accelerated by the sound drone policy, may help our economy by promoted employment, commerce, and more.

### ***2.3 Leisure Sports Motivation***

Often, leisure and sports are interchangeable used in our society. For policy makers to devise sound policy that would promote a leisure and sports industry like drone, they should understand how

people set their foot in a particular leisure activity. Generally, people's motive to participate in leisure activity can be found in so-called select property. Select properties refer to the process and standards through which potential consumers register a need, seek pertaining information, comparing alternatives, decision making, and evaluating the made decision to determine whether or not they will make the same decision in the future (Sohn & Shin 2008; Yoon 2010). Though this select property is largely affected by the availability of a particular leisure, we must understand how the government's policy effort play a part in reinforcing this motive.

#### ***2.4 Driving Factors of Leisure Participation***

Though many leisure activities are cost-free, technology-based leisure like drone does not fall into this category. So we ought to examine how this cost incurring leisure activities attract potential consumers. If we were to put a leisure industry into a service category, then we can analyze from the consumer values and a service mechanism. A consumer value is formulated after experiencing an offer a particular service. (Jensen & Hansen 2007). This perceived value that appear after consumers experience a service is equivalent to the overall evaluation of the service. (Zeithaml 1998). This means that after consumers experience a leisure activity, they come up with a value, which may translate into the success of the leisure industry. Of many factors that will reinforce this consumer experience, the government policy is the centerpiece. This may sound foreign to people who see leisure as nothing more than a private business. But in countries like Korea, where policy governs and perceives leisure industry as an important channel fueling the country's economy, leisure industry and associated policymaking efforts cannot be disregarded. When measuring the success of a leisure policy, we must understand how leisure related factors operate to account for the consumer satisfaction. Only then can we accurately predict the effects of leisure policy that would set the stage for the coming age of drone use in our society.

#### **Research Questions**

1. Is there a perception difference in leisure activity by the participation in leisure clubs?
2. What variables are correlated with people's overall satisfaction with leisure?
3. Does people's leisure policy perception affect the leisure satisfaction

### **3. Analysis**

#### ***3.1 Data Collection***

The data used in this analysis was drawn from the 2016 Survey on National Leisure Activity conducted by the Ministry of Culture, Sports and Tourism. The data were collected from September and October, targeting 10,602 respondents whose age are 15 or older. In this analysis, some of the outliers and insincere responses were eliminated to increase the accuracy of data interpretation.

#### ***3.2 Methods***

To investigate the research question above, following methods had been carried out. To check to see if each question item can point to each psychological construct, item reliability was measured using Cronbach's coefficient *alpha*. To see the effects of joining leisure club, an independent sample *t*-test was conducted. To see how variables are correlated, Pearson's Correlation analysis was conducted. To see what variables explain the people's overall leisure satisfaction, a linear regression analysis was conducted.

Table 1. Descriptive Statistics

|                          | <i>N</i> | Mean | SD   | Min  | Max |
|--------------------------|----------|------|------|------|-----|
| Leisure Satisfaction     | 937      | 4.65 | 1.06 | 1    | 7   |
| Gender                   | 937      | .20  | .40  | 0    | 1   |
| Time (hrs.)for Leisure   | 937      | 3.77 | 1.36 | 1    | 12  |
| Joined Club              | 937      | .17  | .38  | 0    | 1   |
| Assess Leisure Industry  | 937      | 5.29 | .81  | 2.33 | 7   |
| Satisfied w/ Leisure Ind | 937      | 5.03 | .84  | 1.67 | 7   |
| Accessibility to Leisure | 937      | 4.62 | 1.05 | 1    | 7   |
| Policy Importance        | 937      | 5.72 | .74  | 2    | 7   |
| Policy Satisfaction      | 937      | 4.94 | .88  | 1    | 7   |
| Leisure is Important     | 937      | 5.53 | .89  | 2    | 7   |
| Leisure is Positive      | 937      | 5.69 | .85  | 4    | 7   |
| Work-Life Balance        | 937      | 4.04 | 1.12 | 1    | 7   |
| Happiness                | 937      | 7.23 | 1.27 | 2    | 10  |
| <i>Valid N</i>           | 937      |      |      |      |     |

Table 1 shows the descriptive statistics of the collected sample. People's leisure satisfaction was approximately 4.65 (SD = 1.06) in the 7-point Likert scale. Looking at the gender composition, only 20% (SD = .40) of our sample was drawn from female responses. When asked about how many hours a day people engage in leisurely activity, our respondents said that they spend the average of 3.77 (SD = 1.36) hours. About 17% of our respondents have joined leisure-related clubs. When asked what people think of the leisure industry of Korea, most of our respondents think it's well above average (M = 5.29, SD = .81). When asked how satisfied they are about the leisure industry of Korea, the respondents were fairly content (M = 5.03, SD = .84). When asked about how accessible leisure activities, the respondents said the accessibility is in the middle (M = 4.62, SD = 1.05). When I asked them about the importance they place on leisure policy, the respondents deemed it is fairly important (M = 5.72, SD = .74). When asked about how satisfied they are about existing leisure policy, they satisfaction was found to be in the middle (M = 4.94, SD = .88). The respondents do think leisure is important aspect of life (M = 5.53, SD = .89). They also think leisure activity has positive effect on their life quality (M = 5.69, SD = .85). When asked about whether or not they enjoy the work-life balance, respondents' answer fell in the middle range (M = 4.04, SD = 1.12). Lastly, the respondents' level of happiness fell in the upper tier of the 10-point scale (M = 7.23, SD = 1.27).

### 3.3 Results

Table 2. Items Measuring Leisure Industry

| Sub-Domain                  | Question Items   | <i>alpha</i> |     |
|-----------------------------|--|--------------|-----|
| Evaluating Leisure Industry | ♦ I think there is decent leisure facility in our country.         | .79          | .81 |
|                             | ♦ I think there is decent leisure goods industry in our country.   |              |     |
|                             | ♦ I think there is decent leisure service industry in our country. |              |     |

|                                   |  |     |
|-----------------------------------|--|-----|
| Satisfied with Leisure Industry   | ♦ I'm satisfied with the leisure facility ( <i>hotel, condo, theme park, park, golf course, ski resort, sports complex</i> ) in our country. | .81 |
|                                   | ♦ I'm satisfied with the leisure goods industry in our country.  | .83 |
|                                   | ♦ I am satisfied with the leisure service industry (exhibition, performance, recreation service, etc.) in our country.                       |     |
| Accessibility of Leisure Facility | ♦ I am aware of the public leisure facility in my neighborhood.  |     |
|                                   | ♦ I think there is enough leisure facility in my neighborhood.   |     |
|                                   | ♦ I am aware of the leisure program available in my neighborhood.  | .90 |
|                                   | ♦ I think leisure program is accessible in my neighborhood.  |     |

Table 2 shows the question items measuring the status quo of leisure industry in Korea. Question items under *evaluating leisure industry* and *satisfaction with leisure industry* appears to have high correlation ( $r = .81$ ). However, I wanted to see how each of these factors contribute to the leisure satisfaction itself. Therefore, the two were included in our analysis as separate factors. Also, accessibility to leisure facility is an important factor that could explain the leisure satisfaction. And the Cronbach's coefficient *alpha* of these question items was .90.

Table 3. Items measuring Leisure Policy

| Sub-Domain                   | Question Items  | Cronbach's Coefficient <i>alpha</i> |
|------------------------------|---|-------------------------------------|
| Importance of Leisure Policy | ♦ Establishing policy to build various leisure facilities is important.                                     | .87                                 |
|                              | ♦ Developing quality leisure program is important.  |                                     |
|                              | ♦ Fostering or training experts for leisure program is important.   |                                     |
|                              | ♦ Promoting leisure clubs is important.   |                                     |
|                              | ♦ Supporting leisure for disadvantaged groups of people is important.                                       |                                     |
|                              | ♦ Legislating laws and policy for quality leisure is important.   |                                     |
|                              | ♦ Promoting legal system for holiday to enjoy leisure is important.   |                                     |
| Satisfied w/ Leisure Policy  | ♦ I am satisfied with existing policy that promotes leisure facility.                                       | .91                                 |
|                              | ♦ I am satisfied with existing policy to develop leisure program.   |                                     |
|                              | ♦ I am satisfied with existing policy that trains leisure experts.  |                                     |
|                              | ♦ I am satisfied with existing policy that promotes leisure club.   |                                     |
|                              | ♦ I am satisfied with existing policy that provides leisure opportunity for disadvantaged groups of people. |                                     |
|                              | ♦ I am satisfied with existing laws and system that would offer quality leisure opportunity.                |                                     |
|                              | ♦ I am satisfied with existing policy that offers more holidays to enjoy leisure.                           |                                     |

Because one of the primary foci of this research was to identify effects of leisure policy, I checked Cronbach's coefficient alpha for question items pointing to *how people place importance on leisure policy* ( $r = .87$ ) and *how satisfied they are with existing leisure policy* ( $r = .91$ ).

Table 4. Question Items for Other Variables

| Sub-Domain           | Question Items  |
|----------------------|---|
| Leisure is Important | ♦ I think leisure activity is essential part of life.   |
| Leisure is Positive  | ♦ I think leisure activity has positive effect on my life (happiness, health, family life, etc.). |
| Work-life Balance    | ♦ I think I enjoy work-life balance.  |
| Happiness            | ♦ In the scale of 10, how happy are you?  |
| Leisure Satisfaction | ♦ I am satisfied with my involvement in leisure activity.   |

Table 4 shows the question items for other variables included in this analysis. Because each of this variable is consisting of a single question item, reliability of this psychological construct cannot be determined with certainty.

Table 5. *t*-test by Leisure Club Involvement

|                               |              | No Club<br>( <i>n</i> = 777) | Joined Club<br>( <i>n</i> = 160) | Mean<br>Difference | <i>t</i> | <i>p</i> -value |
|-------------------------------|--------------|------------------------------|----------------------------------|--------------------|----------|-----------------|
| Leisure Satisfaction          | Mean<br>(SD) | 4.61<br>(.04)                | 4.86<br>(.09)                    | -.24               | -2.66    | <b>.01</b>      |
| Gender                        | Mean<br>(SD) | .21<br>(.01)                 | .13<br>(.03)                     | .08                | 2.41     | <b>.02</b>      |
| Time for Leisure              | Mean<br>(SD) | 3.70<br>(.05)                | 4.07<br>(.14)                    | -.37               | -3.12    | <b>.00</b>      |
| Assess Leisure Industry       | Mean<br>(SD) | 5.33<br>(.03)                | 5.14<br>(.07)                    | .19                | 2.66     | <b>.01</b>      |
| Satisfied w/ Leisure Industry | Mean<br>(SD) | 5.04<br>(.03)                | 4.98<br>(.03)                    | .06                | .85      | .40             |
| Accessibility to Leisure      | Mean<br>(SD) | 4.67<br>(.04)                | 4.38<br>(.09)                    | .29                | 3.18     | <b>.00</b>      |
| Policy Importance             | Mean<br>(SD) | 5.72<br>(.03)                | 5.72<br>(.06)                    | .00                | .01      | 1.00            |
| Policy Satisfaction           | Mean<br>(SD) | 4.97<br>(.03)                | 4.77<br>(.09)                    | .20                | 2.64     | <b>.01</b>      |
| Leisure is Important          | Mean<br>(SD) | 5.49<br>(.03)                | 5.69<br>(.08)                    | -.19               | -2.53    | <b>.01</b>      |
| Leisure is Positive           | Mean<br>(SD) | 5.64<br>(.03)                | 5.94<br>(.07)                    | .30                | -4.04    | <b>.00</b>      |
| Work-Life Balance             | Mean<br>(SD) | 4.02<br>(.04)                | 4.13<br>(.09)                    | -.10               | -1.06    | .29             |
| Happiness                     | Mean<br>(SD) | 7.18<br>(.05)                | 7.48<br>(.10)                    | -.30               | -2.73    | <b>.01</b>      |

Next, Table 5 shows an independent sample t-test by the respondents’ participation in leisure club. When compared the mean differences, the overall leisure satisfaction by the participation was statistically significant ( $t = -2.66, p = .01$ ), so we can see that people who are in leisure club are more satisfied with overall leisure status quo in Korea. The gender difference was also statistically significant ( $t = 2.41, p = .02$ ), so women are less likely to join leisure club. The time (hours) people spend on leisure activity was statistically significant ( $t = -3.12, p = .00$ ), so we can say that people who are in leisure club spend more time engaging in leisure activity. How people assess(evaluate) leisure industry was statistically significant ( $t = 2.66, p = .01$ ). Here, those who are in leisure club are more likely to evaluate existing leisure industry negatively. In a similar vein, those who are participating in leisure club are less likely to think that people’s accessibility to leisure activity is in an acceptable range compared to those who aren’t ( $t = 3.18, p = .00$ ). Those who are in leisure club are less likely to be satisfied with leisure policy ( $t = 2.64, p = .01$ ). Those who are in leisure club are more likely to place importance of leisure activity ( $t = -2.53, p = .01$ ). Those who are in leisure club are more likely to think leisure activity has positive effect on their life quality ( $t = -4.04, p = .00$ ). Lastly, those who are in leisure club are happier with their life than those who aren’t ( $t = -2.73, p = .01$ ).

Table 6. Pearson’s Correlation Analysis

|                              | Leisure Satis | Gender | Leisure Time Weekdays | Joined Club | Assess Leisure Industry | Satisfied w/ Leisure Indus. | Access to Leisure | Importance of Leisure Policy | Satisfied w/ Leisure Policy | Leisure is Important | Leisure is Positive | Work-Life Balance |
|------------------------------|---------------|--------|-----------------------|-------------|-------------------------|-----------------------------|-------------------|------------------------------|-----------------------------|----------------------|---------------------|-------------------|
| Gender                       | .00           |        |                       |             |                         |                             |                   |                              |                             |                      |                     |                   |
| TimeWeek                     | .05           | .05    |                       |             |                         |                             |                   |                              |                             |                      |                     |                   |
| JoinedClub                   | .09**         | -.08*  | .10**                 |             |                         |                             |                   |                              |                             |                      |                     |                   |
| Assess Leis Industry         | .21**         | .03    | -.07*                 | .09**       |                         |                             |                   |                              |                             |                      |                     |                   |
| Satisfied w/ LeisIndustry    | .23**         | .02    | -.10**                | -.03        | .68**                   |                             |                   |                              |                             |                      |                     |                   |
| Access to Leisure            | .23**         | .04    | -.18**                | .10**       | .47**                   | .46**                       |                   |                              |                             |                      |                     |                   |
| Importance of Leisure Policy | .09**         | -.04   | .07*                  | .00         | .33**                   | .23**                       | .18**             |                              |                             |                      |                     |                   |
| Satisfied w/ Leisure Policy  | .29**         | -.02   | -.17**                | .09**       | .51**                   | .58**                       | .50**             | .35**                        |                             |                      |                     |                   |
| Leisure is Important         | .18**         | .00    | .14**                 | .08*        | .06                     | .03                         | -.09**            | .24**                        | .01                         |                      |                     |                   |
| Leisure is Positive          | .14**         | .00    | .17**                 | .13**       | .08*                    | .07*                        | -.12**            | .24**                        | .02                         | .71**                |                     |                   |
| Work-Life Balance            | .50**         | .04    | .00                   | .03         | .14**                   | .12**                       | .21**             | .04                          | .21**                       | -.03                 | -.06*               |                   |
| Happy                        | .41**         | .07*   | .02                   | .09**       | .27**                   | .27**                       | .25**             | .19**                        | .33**                       | .21**                | .24**               | .21**             |

\*  $p < .05$     \*\*  $p < .01$

The primary focus of this correlation analysis is to see the pair-wise correlation of our people’s overall leisure satisfaction with other variables, we should look at the first column. Most of the variables are significantly correlated with the leisure satisfaction. Interestingly enough, the correlation of gender is close to zero, though it is not statistically significant. With leisure satisfaction, a strong correlation was found with people’s work-life balance ( $r = .50, p < .01$ ) and overall happiness ( $r = .41, p < .01$ ).

Also, the three variables indicating people’s perception towards Korea’s leisure industry—(1) assessing leisure industry, (2) satisfaction with leisure industry, (3) accessibility of leisure—seem to be highly correlated with people’s satisfaction with leisure policy. Based on this research, further research is advised to ascertain the relationship discovered.

Table 7. Regression Model

|                       | Unstandardized Coefficient |                | <i>t</i> | <i>p</i> -value |
|-----------------------|----------------------------|----------------|----------|-----------------|
|                       | <i>B</i>                   | Standard Error |          |                 |
| Constant              | -.16                       | .31            | -.53     | .60             |
| Gender                | -.09                       | .07            | -1.36    | .17             |
| Time Spent            | .05                        | .02            | 2.21     | <b>.03</b>      |
| Joined Club           | .12                        | .07            | 1.67     | .10             |
| Assess Leisure In.    | -.01                       | .05            | -.27     | .79             |
| Satisfied w/ Leis In. | .07                        | .05            | 1.44     | .15             |
| Access to Leisure     | .04                        | .03            | 1.31     | .19             |
| Important Policy      | -.09                       | .04            | -2.23    | <b>.03</b>      |
| Satisfied w/ Policy   | .13                        | .04            | 3.14     | <b>.00</b>      |
| Leisure is Importa.   | .18                        | .04            | 3.98     | <b>.00</b>      |
| Leisure is Positive   | .00                        | .05            | -.02     | .99             |
| Work-Life Balance     | .39                        | .03            | 15.4     | <b>.00</b>      |
| Happiness             | .20                        | .02            | 8.44     | <b>.00</b>      |

#### Regression Equation

“ $\hat{Y} = -.16 - .09 (\text{Gender}) + .05 (\text{Time Spent}) + .12 (\text{Joined Club}) - .01 (\text{Assess Leisure Industry}) + .07 (\text{Satisfied with Leisure Industry}) + .04 (\text{Access to Leisure}) - .09 (\text{Important Policy}) + .13 (\text{Satisfied with Leisure Policy}) + .18 (\text{Leisure is Important}) + .00 (\text{Leisure is positive}) + .39 (\text{Work-Life Balance}) + .20 (\text{Happiness})$ ”

I fitted a regression model predicting people’s leisure satisfaction. And the F-Statistics was 49.13 (12, 924),  $p < .001$ ; therefore, the model’s predictability was higher than a model using mean values of the independent variables to predict the leisure satisfaction. The  $R^2$  value of the model was .39, meaning that approximately 39% of the variance in leisure satisfaction is explained by the independent variables included in this regression model.

For every one unit increase in the time people want to spend for leisure activity, there is a predicted increase of .05 ( $p = .03$ ). And for every one unit increase in how people place importance in a leisure policy, there is a predicted decrease of .09 ( $p = .03$ ). For every one unit increase in how satisfied people are with existing leisure policy, there is a predicted increase of .13 ( $p = .002$ ). For every one unit increase in work-life balance, there is a predicted increase of .39 ( $p < .001$ ). Lastly, for every one unit increase in happiness, there is a predicted increase of .20 ( $p < .001$ ). One of the important takeaways from this regression model is that the condition or the



status of the leisure industry does not explain the people’s overall satisfaction with a particular leisure industry (all three variables were not statistically significant). On the other hand, how people are satisfied with a particular leisure policy or how much importance one place on a particular leisure policy positively explain the increase of leisure satisfaction.

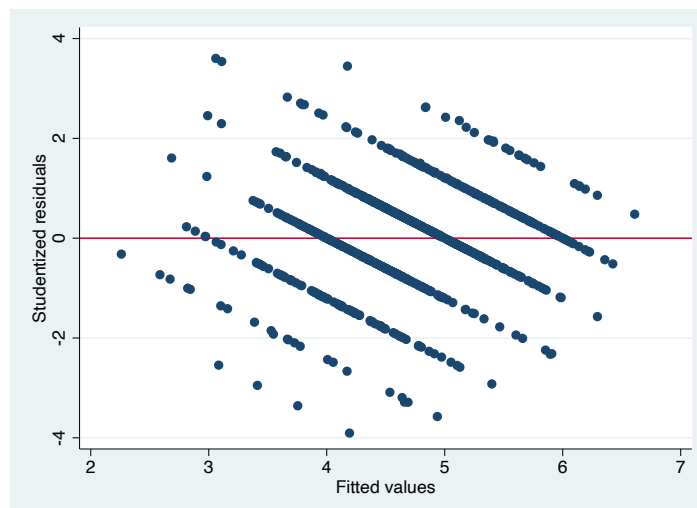
Table 8. VIF

|                       | <i>VIF</i>  | <i>1/VIF</i> |
|-----------------------|-------------|--------------|
| Gender                | 1.02        | .98          |
| Time Spent            | 1.09        | .91          |
| Joined Club           | 1.06        | .94          |
| Assess Leisure In.    | 2.15        | .47          |
| Satisfied w/ Leis In. | 2.23        | .45          |
| Access to Leisure     | 1.58        | .63          |
| Important Policy      | 1.29        | .77          |
| Satisfied w/ Policy   | 1.92        | .52          |
| Leisure is Importa.   | 2.06        | .49          |
| Leisure is Positive   | 2.19        | .46          |
| Work-Life Balance     | 1.11        | .90          |
| Happiness             | 1.28        | .78          |
| <i>Mean VIF</i>       | <i>1.58</i> |              |

*Regression Equation*

To check to see if there’s a concern for multicollinearity in this ordinary least square (OLS) regression analysis, I’ve checked the variance inflation factor (VIF) as suggested by James, Witten, Hastie, & Tibshirani (2017). And it is known that a VIF value greater than 10 indicates a high correlation, suggesting that there is multicollinearity. As illustrated in Table 8, however, no VIF value is greater than 10. Therefore, the concern for multicollinearity has been ruled out from the analysis.

Figure 1. Constant Variance Assumption



I've checked the constant variance assumption—or linearity assumption—by plotting residuals. And as illustrated in [Figure 1], no curvature, which suggest a nonlinear trending, was found. Thus, we don't have to be concerned with the chance of this model violating the linearity assumption.

Figure 2. Normality check via Histogram & QQ-plot

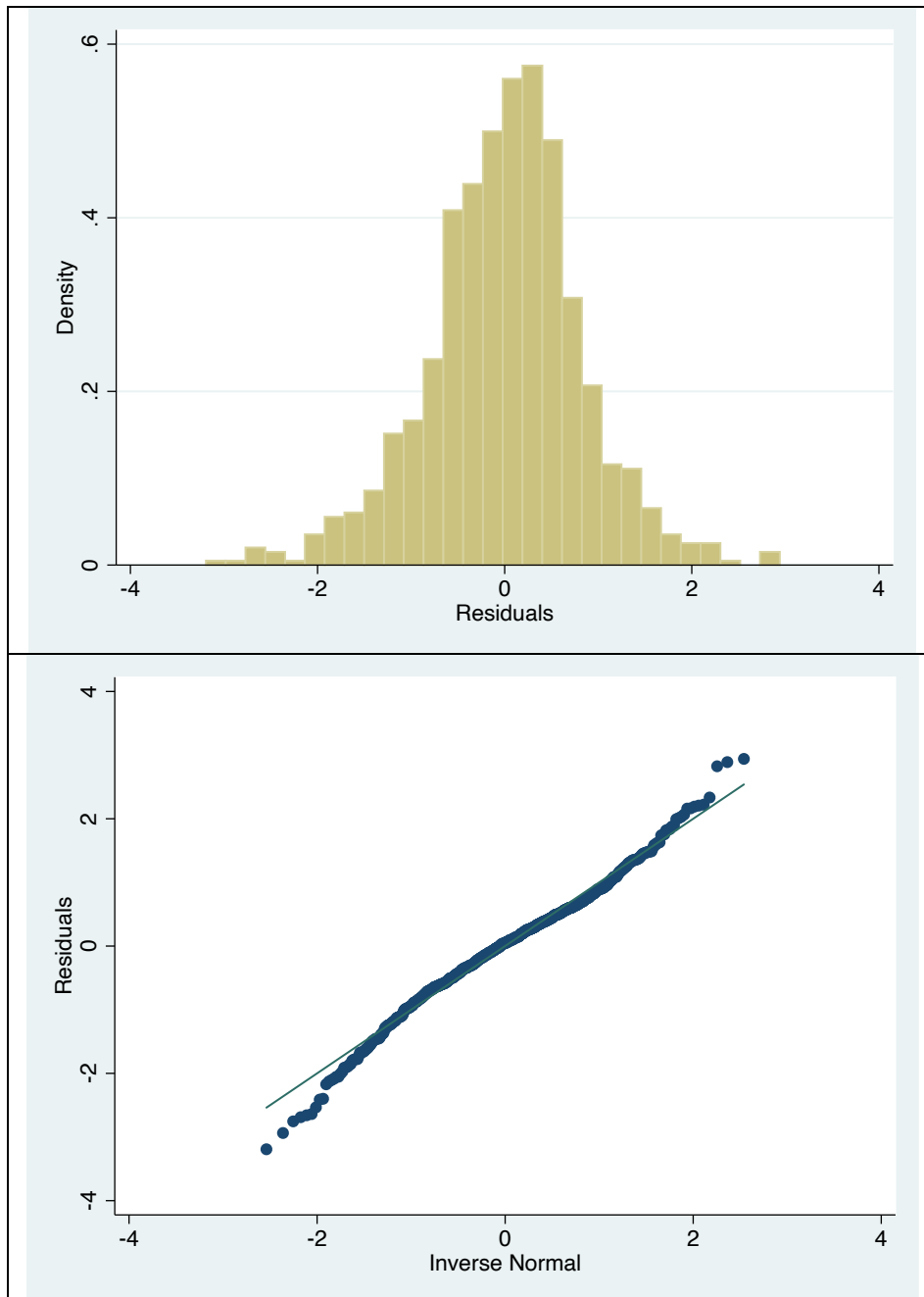


Figure 2 shows the *histogram* and *qq-plot* to visually check the normality assumption. The histogram shows that residuals are more or less drawing a bell-shaped curve, we can say residuals are normally distributed (Field, 2009). Also from qq-plot, most residuals fall neatly around the line, we do not need to be concerned with the chance of violating normality assumption. Also as a reference, I've checked the skewness and kurtosis of the residuals, skewness was  $-0.21$  and kurtosis was  $4.07$ . Since skewness greater than the absolute value of  $2$  suggest that it is not sufficiently normal,  $-0.21$  was clearly in the safe range. Also, for the kurtosis an absolute value greater than  $7$  suggests that there is a concern. However,  $4.07$  means it is in an acceptable range.

## Conclusion

When looking at the difference caused by leisure club participation, I've found a contradicting phenomenon. Those who are in leisure club are more satisfied with leisure itself; however, they are *less* likely to evaluate Korea's leisure industry positively. Also, they are less likely to think that people have sufficient accessibility to leisure activity. And they are *less* likely to be content with leisure policy. Better yet, they are *more* likely to be happy with their life. Though we cannot link these findings with evidence from this analysis alone, we may reasonably claim that these people who are engaging in leisure activity through leisure club have more or less objective opinions about the leisure policy and its effects.

Next, when we look at the variables associated with leisure satisfaction, (1) how people evaluate the status quo of leisure industry, (2) how people are satisfied with leisure industry, (3) the accessibility to leisure, and (4) how people are satisfied with leisure policy were moderately correlated with the overall leisure satisfaction ( $r = .21 \sim .29$ ). More importantly, (5) people who value work-life balance and (6) how happy they feel about their life in general are strongly correlated with the overall leisure satisfaction ( $r = .41 \sim .50$ ). So these factors are the targets that policymakers should take into account when devising sound leisure policy.

When it comes to the question whether or not people's leisure policy perception affects the overall leisure satisfaction, both the importance people place on leisure policy and the leisure policy satisfaction affect the leisure policy itself. Drawing from this finding, we can safely conclude that leisure policy is the centerpiece of launching a new type of leisure medium in Korea.

Therefore, to make a sound policy that would promote public satisfaction and would ensure a policy endeavor, this leisure policy perception must be carefully examined. Also, those who partake in leisure club can be good target groups that can point policymakers into the right direction as they set the stage for the leisure industry—particularly drone industry—in Korea.

## References

- Ahn, J. 2015. "Global trends on the regulations of the civil unmanned aircraft system (UAS)." *Korea Aerospace Research Institute* 13(1): 51-67.
- Ahn, H., Park, J., & Yoo, S. 2014. "A study of the status of UAS certification system and airworthiness standards." *Journal of the Korean Society for Aeronautical and Space Sciences* 42(1): 893-901.
- Alvarez, J. A., Cristobal, M. V., Gamalinda, M. T., Malino, A., & Miguel, J. 2008. "Design of a wireless scoring system for fencing using RFID technology." *International Journal of Sports Science and Engineering* 2(2): 79-85.
- Choi, K., Lee, I., & Li, H. 2017. "An application framework for drone geo-spatial data for efficient administrative tasks: focusing on the case of Seoul metropolitan government." *The Korea Spatial Planning Review* 65-81.
- Choi, B. 2017. "Unmanned aerial vehicle (drone) accidents and legal responsibility." *Korea Technology Innovation Society* 5: 71-79.
- Dyer, B. 2015. "The controversy of sports technology: a systematic review." *SpringerPlus* 4(1): 524.
- Field, A. 2009. *Discovering statistics using SPSS*. London: Sage Publications.
- James, G., Witten, D., Hastie, T., & Tibshirani, R. 2013. *An introduction to statistical learning*, Vol. 112, pp. 3-7. New York: Springer.
- Kang, W. 2017. "A study on the development decision of search and rescue drones: focused on Kingdon's policy stream model." *Korea Security Science Association* 11-32.
- Kang, W., Jung, Y., & Hwang, I. 2018. "Development and trends of unmanned vehicles like drone, automatic vehicles. KICS (Korea Institute of Communication Sciences)." *Information & Communication Magazine-Open Lecture Series* 35(1): 28-35.
- Kim, J., & Kim, R. 2009. "A study on improvement of service quality at a sport-leisure industry exhibition." *Korean Journal of Sport Science* 20(2): 264-275.
- Kim, J. 2017. "Making roadmap for unmanned vehicle technology for the country's economy." *Nara Economy*, April, 16-17.
- Kim, J., & Kim, H. 2018. "Direction and Tasks of the Urban Planning in the Presence of Drones." *Journal of Korea Planning Association* 53(1): 51-61.

- Kim, S. & Kim, S. 2014. "Trends and implications of military unmanned aerial vehicles of foreign countries." *Korea Institute for Defense Analysis Defense Weekly*, 1501, 1-11.
- Kim, H., Kang, G., Seo, H., Jung, M., Choi, J., Kang, J., Kim, S. 2017. "Trends and future prospects of 5G and unmanned vehicles technology." *Korea Institute of Communication Services* 6: 54-60.
- Lee, I. 2018. "A debate about the change of drone rules." *Korea Drone Studies* 1(1): 3-38.
- Lee, S., & Kang, W. 2019. "A study on the reestablishment of the drone's concept." *Korean Security Journal* 58: 35-58.
- Lee, S. & Kim, Y. 2017. "A case study for the introduction of drone." *Architectural Institute of Korea Conference Proceeding* 37(2): 994-997.
- Lee, Y. 2016. "Strategy reviews on the 3-dimensional map and positioning systems for mobility vehicles, autonomous cars and drones." *Korea Society of Surveying, Geodesy, Photogrammetry, and Cartography* 4: 64-65.
- Lee, W. 2015. "Urban Management, using drone. BDI (Busan Development Institute)." *Policy Focus* 288: 1-12.
- Sohn, J. & Shin, D. 2008. "Tour industry: a study on tourists choosing seaside towns for tourism." *Korean Accademic Society of Hotel Administration*. Conference Proceeding, 325-339.
- Min, J., & Park, J. 2018. *Drone Studies*. Baewoom.
- Townsend, A. M. 2013. *Smart cities: Big data, civic hackers, and the quest for a new utopia*. New York: WW Norton & Company.
- Yoon, J. 2010. "A study on the influence relationship of tourism motivations, variable options and satisfactions in the family tourists." *Journal of Tourism and Leisure Research* 22(5): 283-301.
- Zeithaml, V. A. 1988. "Consumer perceptions of price, quality and value. A means-end model and synthesis of evidence." *Journal of Marketing* 52(3): 2-22.