Measuring Puerto Ricans' knowledge of the national, subnational and Latin American flags

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Abstract

This study tests Puerto Ricans' knowledge about the national and municipal flag, since it is known that teaching with flags is part of the social studies standards of the island. Two questionnaires were provided to 50 participants to test their knowledge of the national, municipal and Latin American flags. For the national and municipal flags, the participants were asked to provide the symbolism. A total of 96% drew the national flag correctly, although no one identified all the symbolisms correctly. Only 2% of the participants identified all Latin American flags correctly. A Chi-square test was performed to test if flag knowledge and level of education were independent variables. The test value was 0.30 which is greater than the $P > 0.10$; therefore, the null hypothesis was accepted: H_o = the level of schooling of the participants and their knowledge of the Puerto Rican flag are independent.

Introduction

Although the origin of flags dates to ancient times (Cordero Alvarado, 2014), vexillology – the study of flags (Smith, 1975; Montaner Frutos, 2013) – was initially 'coined' as a discipline in the 1960s by Dr. Whitney Smith (Orenski, 2003). Flags are an object of communication, expressing political ideologies, history and cultural aspirations (Erbez Rodriguez and Balbuena Castellano, 2008; Minahan 2010; Kizilçaoğlu, 2014). Such communication represents the value of a nation, reflecting its change and transformation through time (Endrst, 1992), honouring the symbolism of national identification (Znamierowski, 2010; Morales-Ramirez, 2015). A nation's symbol(s) carries strong feelings that summarize its essence (Eriksen and Jenkins, 2007; Kilinc, Tarman & Aydın, 2018; Kilinc, 2015; Kilinc & Dere, 2013; Znamierowski, 2010; Purcell, 2012). It is important to recognize that such symbols are not exclusive to the independent states of the

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world (Minahan, 2010). Territories and other dependencies also incorporate their own 'local' symbols into many of their flag designs (Whyte, 2007; Minahan, 2010).

Scientific studies in vexillology are still very scarce (Orenski, 2003; Morales-Ramirez, 2015). As the discipline endeavours to find its voice in the scientific world, there are a few vexillologists doing research and not just cataloguing flags (Eriksen and Jenkins, 2007; Morales-Ramirez, 2015). For a vexillologist, it is critical to conduct analytical studies of flags which is needed as part of the scientific nature of the discipline (Orenski, 2003; Gregoric, 2010; Purcell, 2012). Some researchers have mentioned vexillonomy as the analytical usage of flags as part of the 'responsibilities' of studying flags (Castany-Prado, 2006). In 2003, Orenski suggested the scientific research in vexillology to have: (1) data collection, (2) pattern recognition, (3) hypotheses and theories, and (4) predicting testable observations. This study incorporates these techniques to measure Puerto Ricans' knowledge about their national and municipal (sub-national) flags. This is the first time a research like this is conducted in Puerto Rico. The main objective is to continue expanding scientific research within vexillology, while understanding the locals' knowledge of flags. Flag knowledge is important because it is part of education standards in the island. Students are expected to be familiarized with such patriotic symbols from early age and throughout several academic grades (Department of Education of Puerto Rico, 2014). Flags are also important because they are linked to national values, ideologies, and core values in general (Becker et al., 2017). Such importance has yet to be explored in Puerto Rico and it also shows the importance of vexillology as an eclectic emerging field within the social sciences.

Puerto Rico is an island in the Caribbean; a previous Spanish colony that is now a territory of the United States (U.S.) (Rodríguez Ramos, 2010; Scarano, 2011; Ramos Hernández, 2013). It wasn't until 1952 that the island's current flag was used as its main national symbol (Ayala and Bernabe, 2009; Gómez Biamón, 2012; Jones, 2014). It is well known that the Puerto Rican flag was modelled after the Cuban flag (Cólon Peña, 2000; Gómez Biamón, 2012), although both flags were inspired by the flag of the U.S. (Minahan, 2010). The Puerto Rican flag was designed in 1895 and the Cuban flag in 1849 (Colón Peña, 2000; Bordeleau, 2014; Méndez-Méndez and Fernandez, 2015). In 1892 a group of rebels seeking independence for Puerto Rico designed the current flag of the island during the anti-Spain revolt (Rivera Arbolay, 2001; Méndez-Méndez and Fernandez, 2015; Denis, 2016). The flag is made up of a blue triangle at the hoist that represents the government's republican powers (Rivera Arbolay, 2001; Scarano, 2011; Bordeleau, 2014). The

red stripes symbolize bloodshed, the white stripes stand for liberty and human rights, and the star represents the Commonwealth of Puerto Rico (Scarano, 2011; Bordeleau, 2014). Overall, the Puerto Rican flag shows the brotherhood in the revolutionary fights in Cuba and the island (Scarano, 2011).
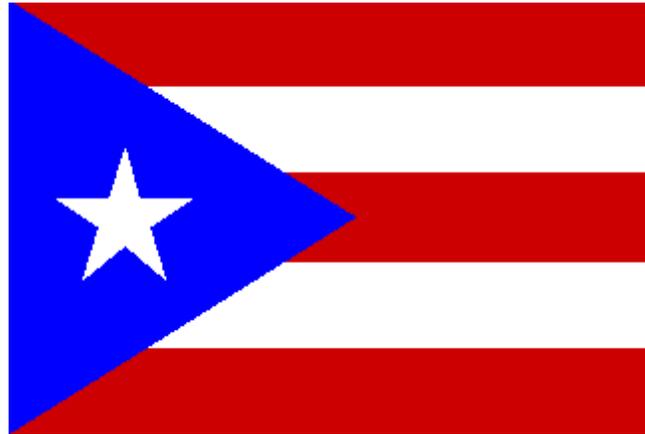

Figure 1. Flag of Puerto Rico (Image obtained with permission from FOTW – Flags of the World website: http://www.crwflags.com/fotw/flags/)

In the island, the flag is taught all throughout primary and secondary school (Department of Education of Puerto Rico, 2014). The national flag is taught in kindergarten – age 5 – and by second grade (primary school) – age 7 – students are expected to know the patriotic symbols of their municipality and the island (INDEC, 2003; Department of Education of Puerto Rico, 2014). Students learn about the national and local symbols such as the flag, anthem and shield (Albert Robatto, 2001; Ramírez, 2002; Ortiz García, 2006). All the 78 *municipios* (municipalities) of the island have a flag and a shield (Toro Sugrañez, 1995; Rivera Arbolay, 2001). By fifth grade –age 10 – students are learning about patriotic symbols of the countries in American continents and in sixth grade – age 11 – these are expanded to the entire world (Department of Education of Puerto Rico, 2014).

Although flags are incorporated in the school standards, knowledge about the flags is not expected to derive from this. In Puerto Rico, both the public and private sectors of education have struggled with their academic test results after an international student evaluation (López Alicia, 2016). Results from the academic achievement tests administered in the island have shown low percentage scores (Vázquez, 2014; Fortuño, 2016). The Department of Education has taken measures to improve such scores and are testing a new test with new parameters (Quiles, 2015; Figueroa Cancel, 2016). Social studies are not a subject incorporated in these tests (Figueroa

Cancel, 2016; Fortuño, 2016; López Alicea, 2016); therefore, no scores or percentages of academic achievement in this subject are available. It is difficult to attest if social studies standards are being met, due to the omission of the subject in these tests. Therefore, this study hopes to shed light on the achievement of the cultural standard present in the social studies standards throughout most academic grades, as explained above. Currently there is no data on how successful the concept of patriotic symbols is in the island or if the success is due to the individuals' prior exposure to them in school (grades K-12), which presents an opportunity to conduct research on topics such as flag knowledge.

Method

Research Design

Surveys in vexillology are common (Kaye, 2001a, 2001b; 2005; Guenter, 2015), with recent flag surveys by Prof. Scot M. Guenter and Amy Langston presented at the North American Vexillological Association's annual meetings, NAVA 49 in 2015 and NAVA 50 in 2016 respectively. Taking from this initiative this research aimed to measure Puerto Ricans' knowledge of the national, subnational, and Latin American flags using questionnaires.

Population and Sample

The target sample size for this study was expected to be relative to the current research in the field (Lenth, 2001), with a sample between 100-500 participants over the age of 18 years old (Kaye, 2001a, 2001b, 2005; Guenter, 2015). The initial sampling method used was a cluster sampling to select participants for a small-scale study in the municipality of San Sebastián. For the final output, only 50 individuals showed up and completed the questionnaires, which did not allow for such sampling method to be carried out. Sample size is critical in reporting proper results and may provide inadequate information if the amount is not sufficient (De Martini, 2008; Luh et al., 2008; Ryan, 2013); therefore, for the scope of this study, a statistical analysis was done with this sample to understand the significance of the results (Ryan, 2013).

Data Collection Tools

A questionnaire was designed to test Puerto Ricans' knowledge about the national flag and the flag of their municipality. The first part of the questionnaire had six questions asking the participants if they knew the flag of Puerto Rico and their hometown/municipality. Participants had to draw the flags with all appropriate parts and provide the symbolism. The questionnaire was provided randomly to adults over the age of 18 years old. Participants were not required to answer any/all

questions and could leave the questionnaire at any time. After the first questionnaire was completed, a second one was created to test Puerto Ricans' knowledge of Latin American flags. Upon reviewing the literature, and knowing that these flags are taught throughout primary and secondary school, this questionnaire was created to understand Puerto Ricans' knowledge of flags of other countries they are exposed to in school. It was created to measure this knowledge and expand upon depending on the results. Since Puerto Rico is a territory of the U.S., the U.S. flag was included in this second questionnaire. Only ten flags, and not all of them, were given in this questionnaire to ensure all participants completed it: Mexico, Cuba, Dominican Republic, Jamaica, Haiti, Brazil, Panama, Argentina, Chile, and the U.S. These flags, except the U.S., were selected randomly from the group of countries that comprise Latin America (Jamaica was included because of its proximity to the island). The flag of the U.S. was included since Puerto Rico is a territory of the country and the flag is displayed next to the Puerto Rican one everywhere. In this part, participants were not asked specific information about the flags. A sample of 50 individuals were given the two questionnaires.

Data Collection

Two questionnaires were provided to all participants. They were asked to complete all questions and were informed they could stop at any time. There was no time limit. All questionnaires were collected and each question was documented and analyzed.

Data Analysis

A Chi-square test was conducted to analyse the dependency/independency of the flag knowledge and schooling. This test is commonly used in social science research (Franke et al., 2012) and examines independency between two variables (Agresti and Kateri, 2011; Franke et al., 2012; McHugh, 2013). It is a non-parametric test that measures nominal or categorical data (Franke et al., 2012; McHugh, 2013) to test two hypotheses: null hypothesis H_o (variables are independent) and alternate hypothesis H_a (variables are not independent) (Lemeshko, 2015). The null hypothesis of this study is that level of schooling and knowledge about the flag are independent variables, while the alternate hypothesis states they are not independent.

Findings

A total of 50 participants completed both questionnaires. All participants were Puerto Ricans and questionnaires were completed in the island. Of these participants, 68% were females and 32% were males. Gender was not used as part of the final analysis of the results. Participants' ages ranged from 18 years old to 72. Six age groups were created: 18-24 years; 25-34 years; 35-44 years; 45-54 years; 55-64 years; and over 65 years. Most of the participants were in the age group of 18-24 years old, with 32% of the entire group. The age group with the least participants was over 65 years with 2%. The remaining age groups had the following percentages of the participants: 25-34 years (12%); 35-44 years (30%); 45-54 years (18%); and 55-64 years (6%). Five categories were created for the level of education of the participants: (1) Elementary school (10%); (2) Junior high school (8%); (3) High school (20%); (4) Didn't attend or finish school (2%); and (5) University degree [any level currently in progress or completed] (60%).

The initial intent of this questionnaire was to only survey participants in the municipality of San Sebastián. Due to the variety of people that either reside outside of their hometown or commute to other municipalities for work or school, ten municipalities are represented in the results. Most of the participants, 66%, are from San Sebastián. Other municipalities represented were: Camuy (14%), Arecibo (6%), and Aguada, Aguadilla, Aguas Buenas, Caguas, Dorado, Lares, and Quebradillas, all with 2% of the participants each. All participants had to answer the same questions about the national flag. However, they were asked to answer the municipal flag question using their hometown/municipality of residency.

The first question asked participants if they knew the flag of Puerto Rico. Only 2% did not answer the question and 2% answered that they did not know the flag. The rest of the participants knew the flag (96%). After this, they had to draw the flag to confirm their answer. Of the total, 98% drew a flag – not necessarily a complete one. All participants that drew a flag had to correctly draw all parts of it (Figure 2). Only 4 %, of the 98% that drew a flag, did not draw the flag with all correct parts. The majority of the 98% that drew a flag did draw all parts correctly (72%), the rest either drew two (2%), five (4%) or six (18%) parts of the flag. These incomplete answers had the star and the triangle. The parts that were incorrect or incomplete were the five stripes. It is not clear if participants forgot to mention all five stripes or if they did not know the exact numbers. If they did not draw all five stripes but mentioned that the flag had that number of stripes this was considered a correct/complete answer. An incomplete answer was when less than five stripes were drawn and/or mentioned. They were also asked to name the colours of each part. Most participants

named a colour (84%). However, not everyone named them correctly. Since there are seven parts to the Puerto Rican flags, participants were asked to name all colours for all the parts. Like the number of parts being mentioned, it is not clear if participants forgot to mention the colours for every part or did not know them, since the results varied: not answering (16%), naming two correctly (4%).
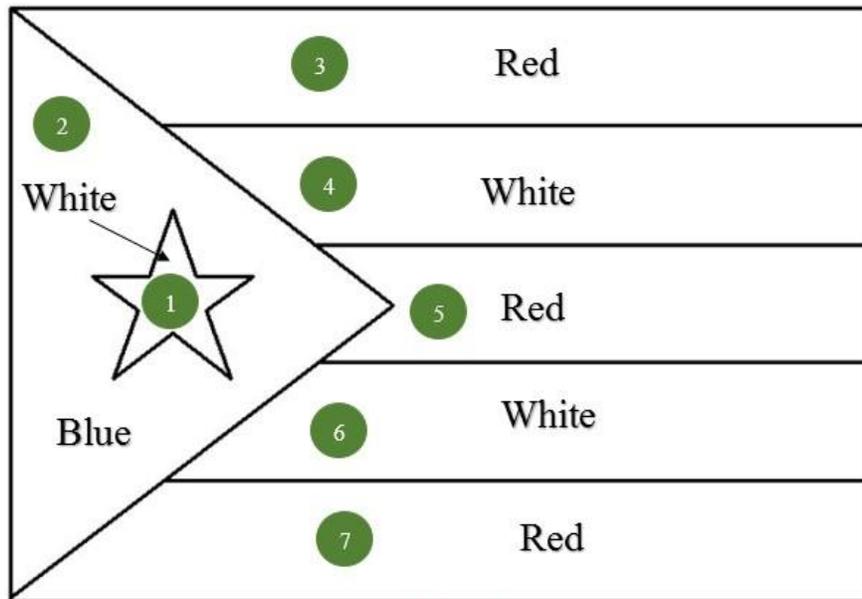

Figure 2. Parts of the flag of Puerto Rico and colours. The circles with the numbers represent the parts participants had to draw correctly. The colours of each part are listed. The number of parts and the number of colours participants had to identify correctly is seven

The final part of the section on the Puerto Rican flag was to write the symbolism of each part of the flag. Although many participants knew the flag and drew most of it accurately, only 28% said they knew the symbolism, with the remaining 72% answering they did not. It was expected for participants to name five symbolisms of the flag: (1) the meaning of the triangle, (2) the red stripes or the colour red, (3) the white stripes or the colour white, (4) the star, and (5) the meaning behind the similarity to the Cuban flag. No one identified all the symbolisms of the parts of the flags: no answer or incorrect answer (76%), three correct symbolisms (2%), two (6%), and one correct symbolism (16%). Answers about the symbolism varied. Some participants alluded to the current political parties for the meaning of the colours, since two of them use a colour of the flag: red (Popular Democratic Party) and blue (Progress New Party). The star was the part of the flag that most answered correctly (80%), followed by the colour red (15%) and the symbolism of

the triangle (5%). There were two participants that answered 'no' to this question about the symbolism and provided an answer. The answers provided were incorrect or incomplete.

The last question of this part of the questionnaire, knowing the symbolism of the national flag, was used to determine the significance of the results based on the education level of the participants. A Chi-square test was performed with the appropriate results. The observed values (actual count) (Table 1) were entered and the expected values were calculated as follows:

$$E = \frac{Mr \; x \; Mc}{n}$$

E = expected value; Mr = total amount for that row; Mc = total amount for that column; and n = total sample size.

Table 1

Knowledge of the Puerto Rican flag by level of schooling. The observed values (actual counts) are listed first and in parenthesis is the expected calculated value is listed.

Level of schooling	Correct knowledge about the symbolism	Incorrect knowledge about the symbolism or no answer provided	Total
Elementary school	2 (1.4)	3 (3.6)	5
Junior high school	0 (1.12)	4 (2.88)	4
High school	2 (2.8)	8 (7.2)	10
University degree (completed or in progress)	9 (8.4)	21 (21.6)	30
No schooling	1 (0.28)	0 (0.72)	1
Total	14	36	n = 50

The next step was to obtain the cells Chi-square value ($\chi2$) in order to get the degree of freedom to determine the significance of the results. For this, the observed values were subtracted from the expected values. The result was squared before dividing it from the expected value:

$$\chi2 = \frac{(O - E)^2}{E}$$

This means that the first cell was calculated as follows: $(2-1.14)^2/1.14 = 0.26$ (Table 2). All the cell values were added to get the cell value for the table, in this case this value is **4.87**. Next, the table's degree of freedom (df) was calculated to get the level of significance for the statistical analysis. The equation below was used to get the df.

([number of rows] – 1) x ([number of columns] – 1)

The equation was as follows: ([4] – 3) x ([7] – 1) = **18**. The final step was to get the results from the Chi-square statistical test. The test results determine if the hypothesized results are verified. It takes the distribution of Chi-square value ($\chi2$) with the calculated degree of freedom. The Chi-square test value was 0.30. Based on this number, our significance level in this analysis is *P > 0.10.* Since the results are greater than this value, the null hypothesis is accepted: H_o = the level of schooling of the participants and their knowledge of the Puerto Rican flag are independent.

Table 2

Expected values and Chi-square values in parenthesis.

Level of schooling	Correct knowledge about the symbolism	Incorrect knowledge about the symbolism or no answer provided	Total
Elementary school	1.4 (0.26)	3.6 (0.1)	5
Junior high school	1.12 (1.12)	2.88 (0.44)	4
High school	2.8 (0.23)	7.2 (0.09)	10
University degree (completed or in progress)	8.4 (0.04)	21.6 (0.02)	30
No schooling	0.28 (1.85)	0.72 (0.72)	1
Total	14	36	n = 50

The next three questions related to the participant's hometown/municipality. The same questions were asked for the flag of their respective hometown/municipality. Similar to the first question about the Puerto Rican flag, participants were asked if they knew the flag of their hometown. The majority answered 'yes', 56%, with 28% answering they did not know it and the remaining 16% did not answer the question. Only 52% of the participants drew a flag –not necessarily one with all correct parts. The remaining percentage, 48%, accounts for participants that did not draw a flag. Due to the variability of municipalities represented in this study, the different flags had different number of parts, ranging from two parts (Lares: the cross and the star) to eight (Aguada: the star, the three diagonal bands, the cross, the name, the blue triangle, and the dove) (Figure 3) (Toro Sugrañes, 1995). For flags like Aguadilla, Arecibo and Caguas, the participants were not required to draw the shield in detail. They were only asked to indicate where

the shield is located in the flag. This was explained prior to the questionnaire to ensure no answers were provided on flags that incorporate external sources in their design. Other symbols like the dove in the flag of Aguada, the *Taíno* sun in the flag of Camuy and the *fleur-de-lys* in the flag of Dorado were not expected to be drawn in detail. Participants were informed to draw a shape and mention was it represented if they were not sure how to draw it.

Figure 3. Flags from the municipalities listed by the participants as their hometown. The number of parts participants had to draw correctly for each of these municipalities are as follows: Aguada (eight parts), Aguadilla (three parts), Aguas Buenas (four parts), Arecibo (three parts), Camuy (three parts), Caguas (seven parts), Dorado (six parts), Lares (two parts), and Quebradillas (four parts). (Images obtained with permission from FOTW – Flags of the World website: http://www.crwflags.com/fotw/flags/)

Only 32% of the participants drew all the parts of their hometown's flag correctly, with 81% of these being from the municipality of San Sebastián. The flag of this municipality has three parts in its design (Figure 4) and each part has its own symbolism: red for the bloodshed during Puerto Rico's first cry for independence during the Lares Revolutionary Movement, the white band stands for the Culebrinas River, and the green is for the mountains surrounding it (Toro Sugrañes, 1995). When asked if they knew the meaning of each part of the flag, 56% of the participants of

all municipalities said they did not. The remaining percentage, 44%, were from incorrect answers or for those who did not answer because they did not know the flag. Of the 33 individuals from San Sebastián, 39% answered all symbolisms of the flag correctly, 36% did not answer and the remaining did not answer correctly. Participants were able to identify the meaning of the colour red. Since the municipality is surrounded by two main rivers – Culebrinas and Guajataca – some participants confused the river the wavy band alludes to. The symbolism of the colour green proves to be the more challenging out of three, with participants not mentioning it in their answer.
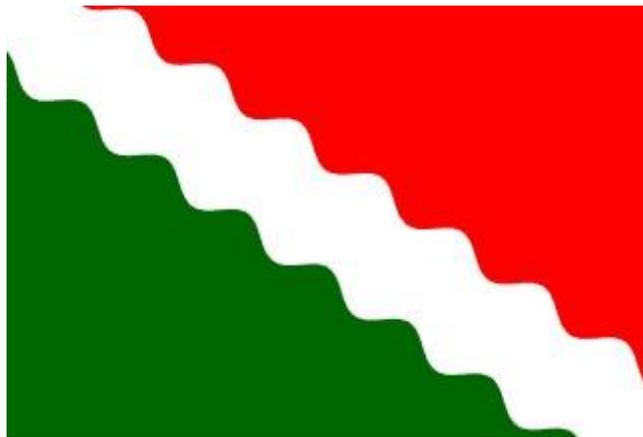

Figure 4. Flag of San Sebastián. (Image obtained with permission from FOTW – Flags of the World website: http://www.crwflags.com/fotw/flags/)

For the second questionnaire, participants were asked to name the country of each of the ten flags provided. There was a total of eight flags from Latin American countries, Jamaica and the flag of the U.S. Flags were chosen based on the proximity of the countries to Puerto Rico (e.g. Cuba, Haiti, Dominican Republic and Jamaica) and popularity of the country (e.g. Argentina and Brazil are well known in sport events). All the 50 participants completed this part of the questionnaire. Of the total, only 2% identified all flags correctly – one individual. Most participants were able to identify five flags correctly (20%). There rest of the results are as follows: one (6%), two (8%), three (14%), four (8%), five (20%), six (6%), seven (14%), eight (16%), nine (6%), and ten (2%) flags. All participants identified the flag of the U.S. correctly and only 4% were able to identify Haiti's flag correctly.

Figure 5. Flags of Latin American chosen for this study. (Images obtained with permission from FOTW – Flags of the World website: http://www.crwflags.com/fotw/flags/).

Discussion, Conclusion and Implications

Most of the participants were able to identify and correctly draw the Puerto Rican flag. It is not clear why or how they were able to do so, as the questionnaire did not further explore this. It is known that Puerto Ricans have a strong sense of pride for their island (Barreto, 2002; Duany, 2003; López-Baralt, 2010). They are also very nationalistic when it comes to cultural identities (Flores, 1993; Barreto, 2002; Font-Guzmán 2013, 2015). Due to its political status of 'unincorporated state', Puerto Rico participates in sports events like the Olympics and beauty pageants that allow for the flag to be flown and exposed (Duany, 2003). The flag can also be seen outside of the island, especially in neighbourhoods in the U.S. with a large Puerto Rican population (Aparicio, 2016). In a neighbourhood in Chicago, Illinois (Humboldt Park) there are two metallic Puerto Rican flags with a length of 18 meters (Agencia EFE, 2015). In these neighbourhoods in

the U.S., the flag is easy to see, especially during the many Puerto Rican Day Parades (Aparicio, 2016; Power, 2016). Puerto Ricans emigrate from the island to the conterminous U.S. to display their pride and cultural identify, expressing it with flags – the bigger the better (Aparicio, 2016; Power, 2016). This allows for more exposure to the island's patriotic symbols and may explain the results of the first question of this questionnaire.

As with many national flags, the Puerto Rican flag is flown in governmental offices throughout the island alongside the flag of the U.S. Therefore, the flag of the U.S. is also commonly seen in the island (LexJuris Puerto Rico, n.d.). Both flags must be flown together, and not complying may result in penalties (LexJuris Puerto Rico, n.d.; Agencia EFE, 2013; Primera Hora, 2013). In schools, the flag of the U.S. and other patriotic symbols are part of the social science curriculum (Department of Education of Puerto Rico, 2014). The exposure to the patriotic symbols of the U.S. can also explain why all participants were able to identify the flag in the second part of the questionnaire. The Chi-square results showed that the significance of knowledge of the Puerto Rican flag and level of education are two independent variables. Therefore, knowledge of these two flags may come from other forms of exposure to it. It is not known how successful the social studies standards in the island are, therefore, research in this area is needed to further understand if there is a correlation. Also, exposure to the Puerto Rican flag comes from many sources that include and are not limited to: music, movies, art, merchandise, among others. A larger sample size will be needed to get a better understanding of these results.

Like the other response, a clear reason about the results of the municipal flag is not known. As with the flag of Puerto Rico and the U.S., each of the 78 municipalities in the island has a flag with its own displaying laws (LexJuris Puerto Rico, n.d.). Under Law #70 of March 20th, 2006, it is mandated that each of the municipalities should use their flag and fly it outside of their town hall; it is up to the municipality's mayor to provide regulations of its usage (LexJuris Puerto Rico, n.d.). The flags are seen in every municipality, in more than one location. Information about their symbolism can be found in each municipality's website (e.g. http://aquiestapuertorico.com/ssdelpepino/) and even in informative materials (e.g. http://www.munss.org/downloads/INFORMACION%20DE%20SAN%20SEBASTIAN.pdf). Although there is no literature to support the exposure Puerto Ricans have to their municipal flags, one is guaranteed to see them flying in places at the municipality, other than governmental offices and buildings, and in textbooks (see Toro Sugrañes, 1993 and Rivera Arbolay, 2001). This can

explain individuals' knowledge about the flag, or at least the reason they were able to draw the flag but not know or remember its symbolism.

For the remaining Latin American flags there was no clear pattern or trend of knowledge identified. For example, certain participants did not identify Jamaica correctly, while others had no problems with it. The only trend observed was the lack of correct answers (or an answer) with the flag of Haiti. As mentioned in the results, only 4% (two individuals) identified the flag correctly. The rest of the participants did not even attempt to name it. Haiti, along with the Dominican Republic form the island of the Hispaniola, which is west of Puerto Rico. It is part of the social science curriculum in Puerto Rico to teach flags such as the Haitian one (Department of Education of Puerto Rico, 2014). However, it is not known how well these are taught, how often, or if educators even incorporate all the flags of the countries in the American continents. The history of the country is part of the curriculum, since events such as the Haitian Revolution are important in history and in the region (Moya Pons, 2012; Dubois, 2013). Such event does not show or incorporate the flag of Haiti, since at that time it was fighting for independence from France (Moya Pons, 2012; Dubois, 2013); therefore, if knowledge of this flag is attributed to Puerto Ricans' exposure to it, then this may explain the lack of knowledge. Haiti is not a high-profile country in the media. When the country does appear in the media, it is usually done in a negative way (Potter, 2009). In major sporting events, such as the Olympics, which is where flags are displayed, and this is major event that many people pay attention to, Haiti does not have a large team or has won many medals (The New Yorker, 2016).

This study tested Puerto Ricans' knowledge about the national and appropriate municipal flags. The results show that most of the participants know the national flag, although the reason or background knowledge for this was not tested. It is hypothesized, that such knowledge of the national flag comes from pride and overexposure to it, as the flag is observed and used outside of the island. No one identified all symbolisms of the national flag correctly. If exposure to the flag is a reason for participants to know it, then this may explain why the symbolism is not known. Flying or displaying the flag everywhere (including abroad) will not help with knowing the symbolism unless it is learned. The symbolism of flags is not often simple, and the Puerto Rican flag is a great example of that. Also, with subnational flags symbolism is rarely found easily, which requires studying it or doing some research to find it. Participants came from different municipalities of the island; therefore, the second part of the first questionnaire showed varied

results. Most participants were from the municipality of San Sebastián. These individuals represented many participants that knew the municipal flag and the symbolism. Although at the national level the results varied throughout all participants. Like the hypothesis about the knowledge of the Puerto Rican flag, it is thought that such knowledge about the municipal flags comes from the exposure residents have to it. San Sebastián is a municipality with ample documents about their patriotic symbols and the flag is observed often in the area.

When asked to identify flags of Latin America and the flag of the U.S., the results of the questionnaire did not show any significant trend. All participants identified the flag of the U.S. correctly, probably because the flag has to be flown next to the Puerto Rican everywhere in the island. Only 2% identified all ten flags provided correctly, including Haiti's flag. This was the only flag the participants did not identify or even attempted to guess. This may be due to the lack of exposure the country gets in the media and major events worldwide. To address some of these concerns and/or knowledge gaps, this study can be conducted with more individuals and extended directly to schools. If educators are following the standards created by the Department of Education of Puerto Rico, students currently learning about such symbolisms should have better scores than most of the individuals that participated in this study. Although it was not the aim of this study, another possibility can be to expand the current questionnaire and ask questions about the background knowledge that allowed the participants to identify and describe a flag. Since education and knowledge do not show a significance of dependency, it is expected that participants provide other sources of knowledge (although the sample size is not enough to provide a definite conclusion). This can be due to the sample size of the study or because of the lack of knowledge about the success of social studies standards. Although standards include flag knowledge in the social studies curriculum, it is not known if these are incorporated and how well these are taught. Overall, this study provides an outline to continue doing research studies in vexillology, specifically in Puerto Rico. It contributes to the ongoing growth of the discipline as a science and shows that scientific research can be conducted in the field in order to depart from just cataloguing flags.

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Appendix

Appendix A. Questionnaire about national and subnational flag knowledge

Título: Símbolos patrios de Puerto Rico: Las banderas
Age: _____   Gender: Masculine _____   Femenine _____
Municipio donde reside: _____
Level of school completed: ☐ escuela elemental ☐ escuela intermedia ☐ escuela
superior ☐ universidad ☐ no fue a la escuela

1. ¿Conoces la bandera de Puerto Rico? (Si la conoces pasa a la pregunta #2. Si no la
    conoces pasa a la pregunta #4.)

    a. Sí _____

    b. No _____

2. Dibuja y menciona los colores de cada parte de la bandera.

3. Detalladamente, explica el simbolismo de cada parte de la bandera.

4. ¿Conoces la bandera de tu municipio? (Si la conoces pasa a la pregunta #5.)

     a. Sí _____

     b. No _____

5. Dibuja y menciona los colores de cada parte de la bandera.

6. Detalladamente, explica el simbolismo de cada parte de la bandera.

Appendix B. Questionnaire about Latin American flags.

Título: Símbolos patrios de Puerto Rico: Las banderas

Edad: _____   Género: Masculino _____   Femenino _____

Municipio donde reside: _____

Nivel de educación completado: ☐ escuela elemental ☐ escuela intermedia ☐ escuela superior ☐ universidad ☐ no fue a la escuela

Parte II

1. Identifica el país al que pertenecen las siguientes banderas:

    a.   _____
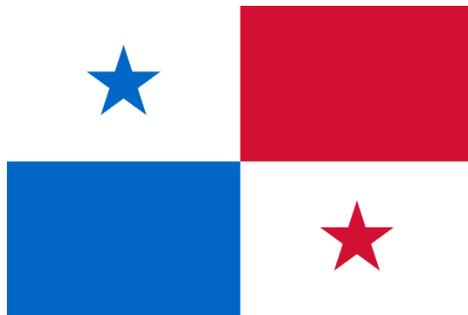
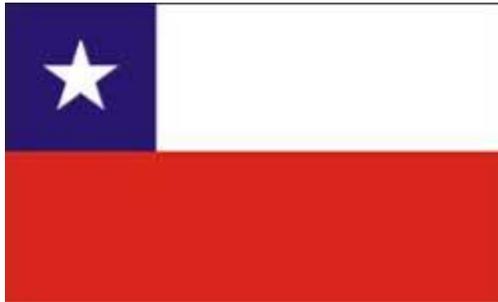   b.   _____

    c.   _____

d. _____

e. _____

f. _____

g. _____

h. _____

i. _____

j. _____