Age and Stimulation Preferences in Theme Park Rides: A Correlational Study

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Abstract

This study examines the correlation between age and the preference for low- and high-stimulation theme park rides. Stimulation is defined here as the level of intensity or excitement associated with a ride, which is determined by five factors: ride speed, level of exposure, amount of disorientation, height, and presence of elements (specifically water). The results of the study confirmed that older theme park guests are interested in riding low-stimulation rides while younger theme park guests are uninterested in riding those same rides. Interestingly, the results did not reveal any correlation between age and high-stimulation rides; young and old theme park guests have a variety of opinions about high-stimulation rides, and there is no discernible trend. Furthermore, the results indicate that all five of the aforementioned factors that contribute to stimulation level are also significantly correlated to age-related ride preference. These results could be a boon to the theme park industry by allowing theme parks to make informed choices that create environments that are appealing to guests of all ages.

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The theme park industry is currently undergoing a period of rapid growth. As the popularity of amusement destinations rises, new theme parks are constructed and old ones are improved around the world. New markets are opening in countries such as China due to rising disposable income levels, and themed entertainment companies are actively trying to expand their user bases (www.strategyr.com).

The obvious way to accomplish this goal is to redefine the theme park experience, which has so long been the domain of teenagers and young adults, into a pastime that is attractive to people of all ages. This shift is visible in the way that theme parks are increasingly marketed as experiences for families, exemplified by Disney's focus on family-friendly fun (Jones & Robinett, 1998). However, the number of studies on the theme park industry that could inform this change is sadly lacking. Theme parks have not been a very popular topic of study in the past, and there is a great need for more data on the inner workings of this booming industry.

The small amount of existing literature on the topic is far more likely to address the preferences of theme park guests as a whole than piecemeal by demographics. For example, Bigné, Andreu, & Gnoth (2005) investigated the reasons that theme park visitors find theme park environments and experiences enjoyable. They determined that an important contributor to enjoyment in the theme park environment is arousal, where engaging and stimulating features are present. Their study also revealed that higher levels of surprise and unexpectedness lead to greater enjoyment. Wong and Cheung (1999) had similar findings in their study of theming. While examining common themes used in themed environments, they discovered that actively engaging, adventurous experiences are most satisfying to the average theme park patron. Both of

these studies are important starting points for my research, because they indicate that high stimulation is viewed as a positive and enjoyable factor overall. My study will delve deeper into this topic an effort to determine to what extent this is true for theme park guests of various ages.

In one final pertinent study, Lin et al. (2007) determined that both logic and emotion play a role in whether a theme park visitor has a positive experience. This study also investigated what aspects of the themed environment are preferred, and discovered that preference is often based on context (e.g. man-made features are seen as less positive in a natural environment than in a developed environment). These findings will be critical to my investigation, because to improve external validity, I will have to be aware of context. The best course of action in my case would probably be to remove context from my survey questions as much as possible, lowering the chance that it would influence my results.

In order to pursue a unique investigation while building on existing research, the topic of this paper will be the interaction between the age of theme-park-goers and their preference for high- or low-stimulation attractions. Stimulation is defined here as the level of intensity and excitement in a theme park ride. Theme park rides have always encompassed a spectrum of stimulation levels, from the low-stimulation carousel to the high-stimulation rollercoaster. However, the relationship between age demographics and preference for high and low stimulation levels in theme parks is not well-understood. This study aims to shed some light on the relationship between these two variables.

My hypothesis for the outcome of this study is that the older participants will have a greater preference for low-stimulation rides and a lesser preference for high-stimulation rides. In contrast, the younger participants will have a greater preference for high-stimulation rides and a lesser preference for low-stimulation rides. I expect to see these results for a variety of reasons.

First of all, older theme park guests may feel that they are more likely to be injured on an intense ride; this is related to age-related reduction of muscle mass, ligament strength, and bone density that may make high-stimulation rides less comfortable and even unsafe for older riders (Spirduso & Francis, 1995). From the opposite perspective, younger individuals are more likely to exhibit sensation-seeking behavior than older adults, and therefore may be more likely to prefer high-stimulation rides due to the excitement they crave (Zuckerman, 1971). To determine which of these factors are at work, a follow-up study would be necessary. There are dozens of potential factors that could explain this outcome, and these are just two of the most likely.

Method

Participants.

This experiment involved 41 participants. The mean age of the participants was 29, with 31 participants younger than 40 years old and 10 participants older than 40 years old. 14 participants were male and 27 female. Participants were a convenience sample which self-selected by responding to a survey posted on social media. No incentives were offered other than the enjoyment of taking a survey related to theme parks.

Design.

This study used a correlational design due to the use of a single survey to gather data. The two variables were the ages of the participants and the theme park ride stimulation preference of the participants.

Materials.

The survey used to collect data consisted of 23 questions. Four questions were related to demographics: the participant's age, gender, average number of times they visit a theme park annually, and the region of the U.S. they call home. Of these four questions, only the question

regarding age was used in the data analysis. The remaining 19 questions out of 23 were related to theme park rides. Each of the 19 questions had a photo of a theme park ride. These 19 rides were carefully selected to be easily recognizable ride types, found both across the U.S. and around the world. They included a wooden rollercoaster, a steel rollercoaster, a rollercoaster with an inverted loop, a suspension rollercoaster, a Ferris wheel, a carousel, a drop tower, a spinning teacup ride, a swinging ship ride, a slingshot ride, a sky coaster, a spinning swings ride, an antique cars ride, bumper cars, a train ride, It's A Small World (a slow indoor boat ride), a laser target shooting ride, a log flume, and a river rapids ride.

Each of these rides was rated objectively for stimulation level. This was accomplished by giving each ride a score of low (1), medium (2), or high (3) on five factors: speed, exposure (whether the rider is enclosed in a ride vehicle or not), disorientation (spinning, sharp turns, and other nausea-inducing movements), height, and elements (the likelihood of getting wet while on the ride). These factors were selected because each one is a component of stimulation, a specific ride characteristic that can induce excitement or fear.

These ratings were then combined to create an overall stimulation rating with a minimum of 5 and a maximum of 15. A ride with a score of 5 would have a low score on all factors, and a ride with a score of 15 would have a high score on all factors. However, it is important to note that the true range of this scale is 5 to 12. Although it is technically possible to have a ride with a score of 15, none of the rides rated as part of this study ever exceeded 12. There is no common ride in the world currently with a high rating on all five factors. Each ride's overall stimulation score and the factors that contributed to it are shown below:

Table 1

Ride Stimulation Scores

Ride	Speed	Exposure	Disorientation	Height	Elements	Total Stimulation Score
Wooden rollercoaster	3	2	1	3	1	10
Steel rollercoaster	3	2	2	3	1	11
Loop rollercoaster	3	2	3	3	1	12
Suspension rollercoaster	3	3	2	3	1	12
Ferris wheel	1	2	1	3	1	8
Carousel	1	2	1	1	1	6
Drop tower	3	3	1	3	1	11
Spinning teacups	2	2	3	1	1	9
Swinging ship	3	2	2	2	1	10
Slingshot	3	2	3	3	1	12
Sky coaster	3	3	2	3	1	12
Spinning swings	2	3	2	2	1	10
Antique cars	1	2	1	1	1	6
Bumper cars	1	2	1	1	1	6
Train	1	1	1	1	1	5
Small World	1	1	1	1	1	5
Laser shooting	1	2	1	1	1	6
Log flume	3	2	1	3	3	12
River rapids	2	2	2	2	2	10

After calculating these scores, rides with a score of 5-8 were categorized as “low stimulation rides” and rides with a score of 9-12 as “high stimulation rides”.

Procedure.

Each question consisted of a photo of one of the 19 rides. The participants were asked to rate how much they want to ride each ride on a scale of 1-7, with 1 being “not at all”, 4 being “neutral” and 7 being “a lot”. The participants would not be aware of the stimulation rating

calculated for each ride; that information would be used later during data analysis. An example question is shown below:

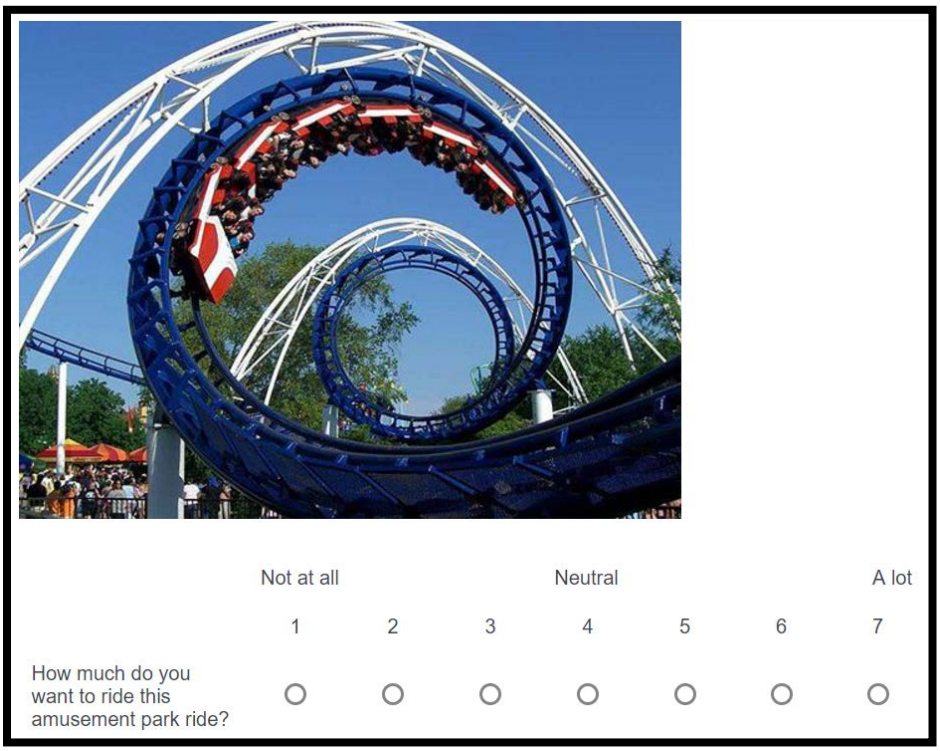

Figure 1. Example survey question.

Each participant's scores were then averaged for high- and low-stimulation rides, resulting in two separate averages. For example, a participant might have given an average score of 6 to high-stimulation rides across all the questions (indicating that they have a desire to ride high-stimulation rides) and an average score of 2 to low-stimulation rides (indicating that they are not interested in riding low-stimulation rides).

At this point, results are analyzed to answer two questions. First of all, does age affect the preference for high- or low-stimulation rides? This question is directly related to the hypothesis. The second question is whether any specific component of the overall stimulation

rating has a greater impact on preference than the others. The answer to this question will determine whether any specific factor that contributes to stimulation level (e.g. speed, exposure, disorientation, height, or elements) has a greater impact on stimulation level preference. For example, if older individuals dislike high-stimulation rides, the cause could be traceable back to one particular factor, such as high ride speed.

Results

All statistical analyses used an alpha level of 0.05. The data was based on 41 participants.

The first result ascertained from the data was the relationship between the age of the participant and their preference for high- and low-stimulation rides. To analyze the data, a Pearson correlation test was used. The results indicated that the relationship between age and preference for low-stimulation rides was significant, with a p-value of 0.000 and an R-value of 0.660. In contrast, the relationship between age and preference for high-stimulation rides was surprisingly not significant, with a p-value of 0.770. These results are shown in the table below (with the significant correlation between age and low stimulation outlined in red):

Table 2

Pearson Correlation Table for Age and High-/Low-Stimulation Rides

Correlations

		Age	Average Low Stimulation Rating	Average High Stimulation Rating
Age	Pearson Correlation	1	.660**	.047
	Sig. (2-tailed)		.000	.770
	N	41	41	41
Average Low Stimulation Rating	Pearson Correlation	.660**	1	-.197
	Sig. (2-tailed)	.000		.217
	N	41	41	41
Average High Stimulation Rating	Pearson Correlation	.047	-.197	1
	Sig. (2-tailed)	.770	.217	
	N	41	41	41

**. Correlation is significant at the 0.01 level (2-tailed).

When examining these results more closely using a scatterplot, the presence of a trend in the age vs low-stimulation rides scenario becomes clear:

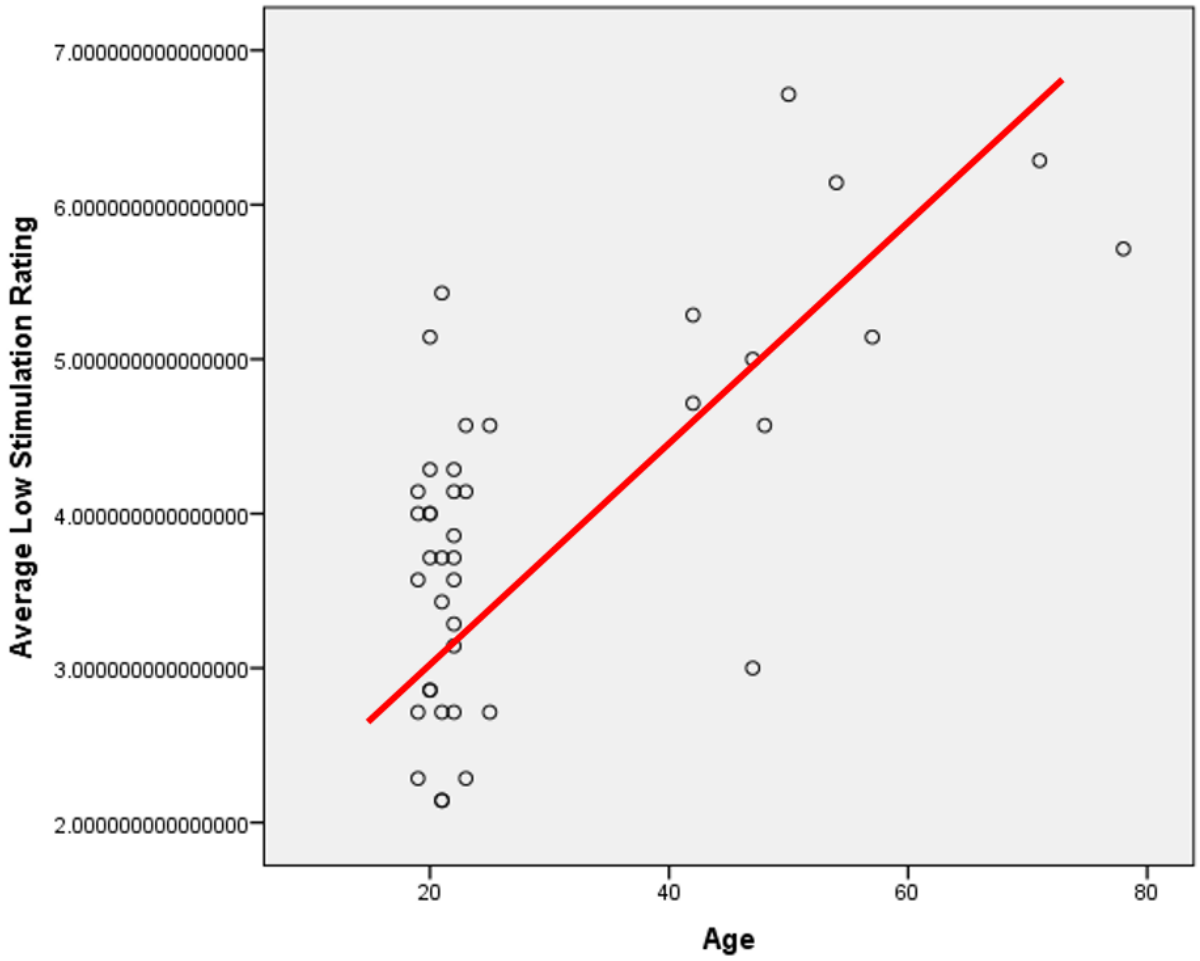

Figure 2. Age and low stimulation correlation scatterplot with best-fit line.

In the same way, when examining the scatterplot of the relationship between age and high-stimulation rides, it is obvious that there is no trend:

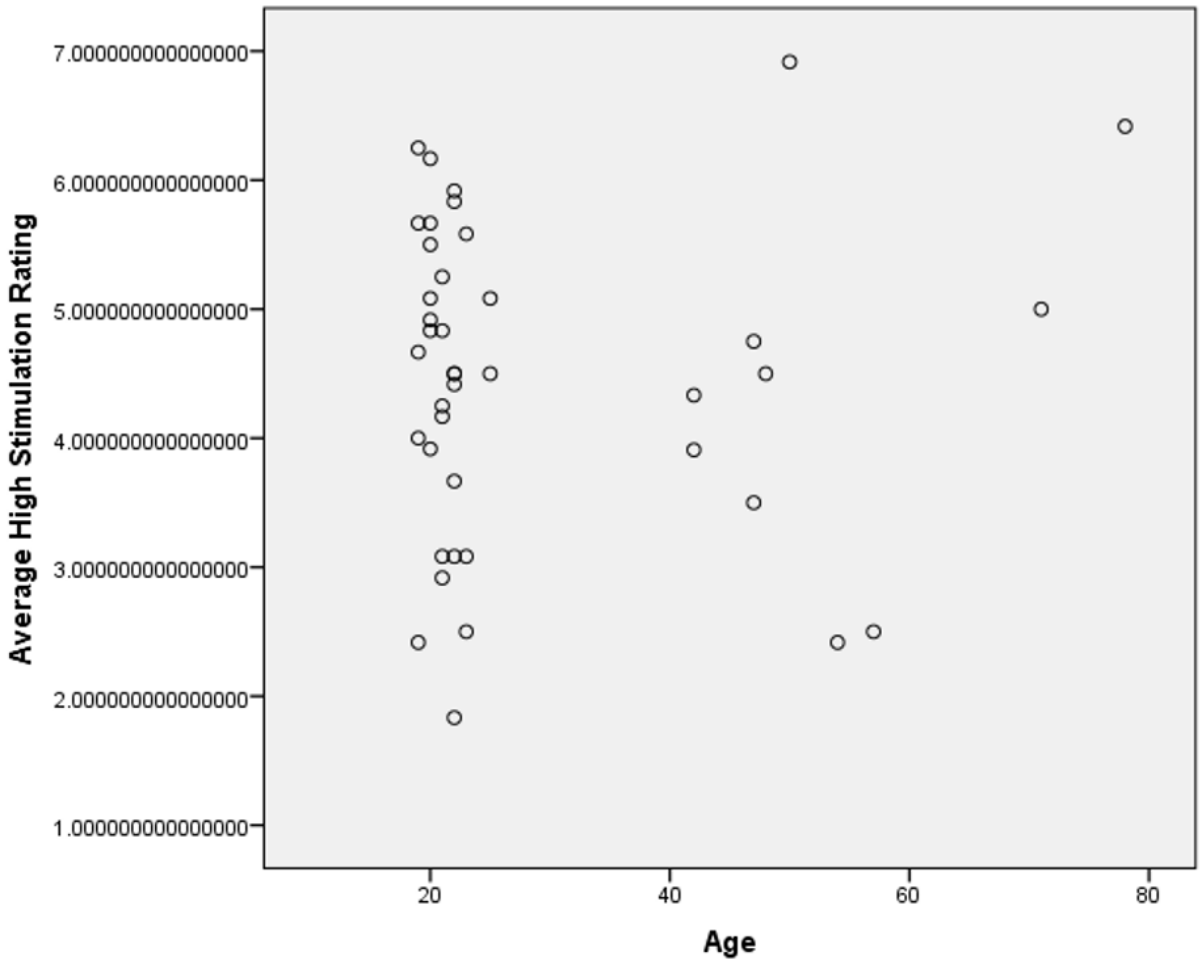

Figure 3. Age and high stimulation correlation scatterplot.

At this point, the data was examined at a more detailed level to determine which factors if any had a greater impact on the overall effect. Speed, exposure, disorientation, height, and elements were all examined in the same way that stimulation had been examined: the scores of all participants were averaged for high-speed and low-speed rides, high-exposure and low-exposure rides, and so on. After these averages were calculated, the data was analyzed to

determine what impact these individual factors had on age-based preference. Tables of results from the five correlations used for the five factors are shown below, with significant correlations outlined in different colors:

Table 3

Pearson Correlation Table for Age and High-/Low-Speed Rides

Correlations

		Age	Average Low Speed Rating	Average High Speed Rating
Age	Pearson Correlation	1	.660**	.026
	Sig. (2-tailed)		.000	.870
	N	41	41	41
Average Low Speed Rating	Pearson Correlation	.660**	1	-.264
	Sig. (2-tailed)	.000		.095
	N	41	41	41
Average High Speed Rating	Pearson Correlation	.026	-.264	1
	Sig. (2-tailed)	.870	.095	
	N	41	41	41

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4

Pearson Correlation Table for Age and High-/Low-Exposure Rides

Correlations

		Age	Average Low Exposure Rating	Average High Exposure Rating
Age	Pearson Correlation	1	.627**	-.017
	Sig. (2-tailed)		.000	.914
	N	41	41	41
Average Low Exposure Rating	Pearson Correlation	.627**	1	-.309*
	Sig. (2-tailed)	.000		.049
	N	41	41	41
Average High Exposure Rating	Pearson Correlation	-.017	-.309*	1
	Sig. (2-tailed)	.914	.049	
	N	41	41	41

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 5

Pearson Correlation Table for Age and High-/Low-Disorientation Rides

Correlations

		Age	Average Low Disorientation Rating	Average High Disorientation Rating
Age	Pearson Correlation	1	.673**	.006
	Sig. (2-tailed)		.000	.970
	N	41	41	41
Average Low Disorientation Rating	Pearson Correlation	.673**	1	.082
	Sig. (2-tailed)	.000		.611
	N	41	41	41
Average High Disorientation Rating	Pearson Correlation	.006	.082	1
	Sig. (2-tailed)	.970	.611	
	N	41	41	41

**. Correlation is significant at the 0.01 level (2-tailed).

Table 6

Pearson Correlation Table for Age and High-/Low-Height Rides

Correlations

		Age	Average Low Height Rating	Average High Height Rating
Age	Pearson Correlation	1	.644**	.060
	Sig. (2-tailed)		.000	.708
	N	41	41	41
Average Low Height Rating	Pearson Correlation	.644**	1	-.125
	Sig. (2-tailed)	.000		.435
	N	41	41	41
Average High Height Rating	Pearson Correlation	.060	-.125	1
	Sig. (2-tailed)	.708	.435	
	N	41	41	41

**. Correlation is significant at the 0.01 level (2-tailed).

Table 7

Pearson Correlation Table for Age and High-/Low-Elements Rides

Correlations

		Age	Average Low Elements Rating	Average High Elements Rating
Age	Pearson Correlation	1	.384*	.252
	Sig. (2-tailed)		.013	.113
	N	41	41	41
Average Low Elements Rating	Pearson Correlation	.384*	1	.404**
	Sig. (2-tailed)	.013		.009
	N	41	41	41
Average High Elements Rating	Pearson Correlation	.252	.404**	1
	Sig. (2-tailed)	.113	.009	
	N	41	41	41

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Interestingly, results indicated that the relationship between age and preference for the low level of every factor was significant. For example, the correlation between preference for low-speed rides and age was significant, with a p-value of 0.000 and an R-value of 0.660, the exact same relationship as the low-stimulation correlation. The correlation between preference for high-speed rides and age was not significant with a p-value of 0.870, which also mirrored the relationship between high-stimulation rides and age. This held true for every factor; the low level of speed, exposure, disorientation, height, elements were all significant, and the high levels of the same five factors were not significant. The scatterplots of age vs preference for low-speed, low-exposure, low-disorientation, and low-height rides are shown below, with best-fit lines in colors matching the corresponding Pearson correlation tables on the previous pages:

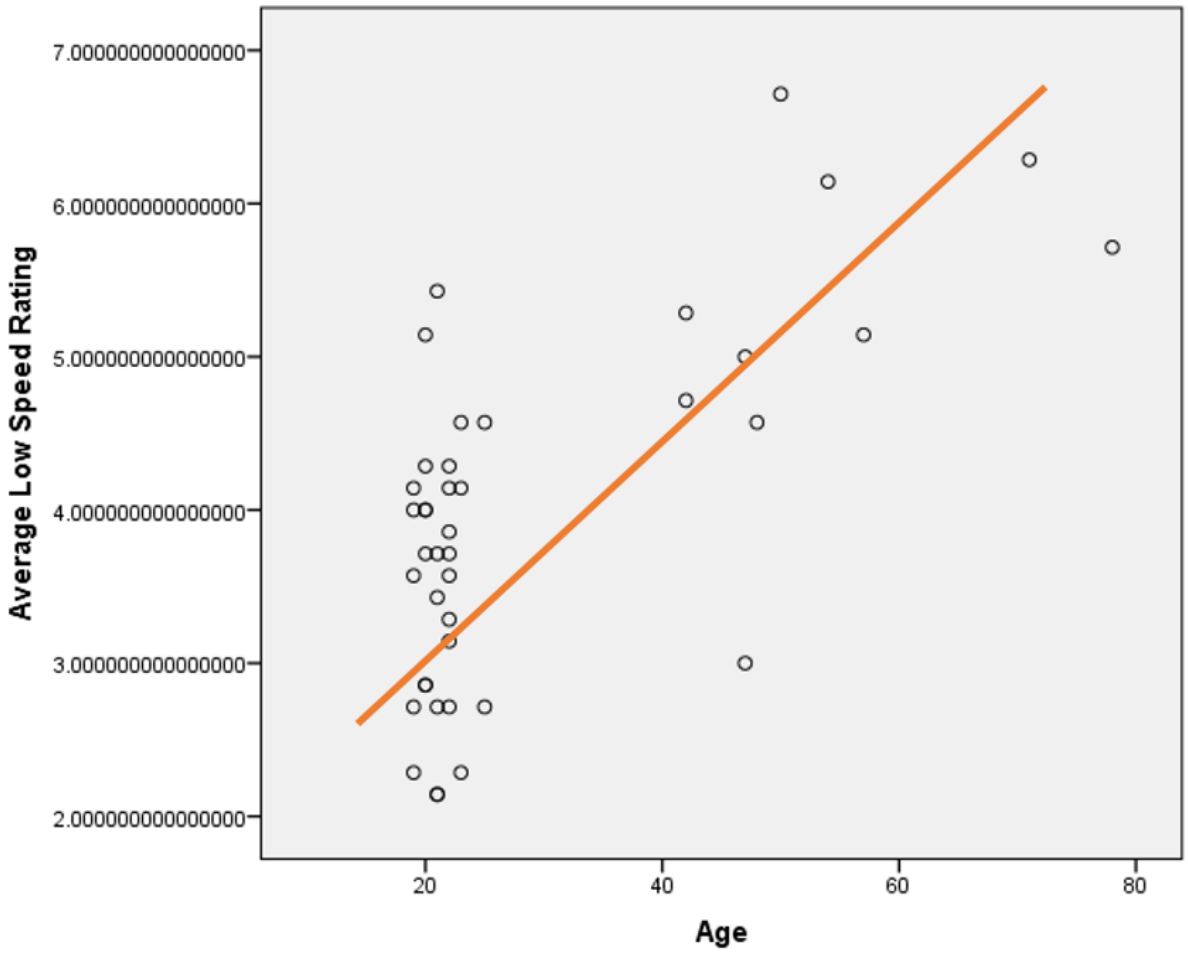

Figure 4. Age and low speed correlation scatterplot with best-fit line.

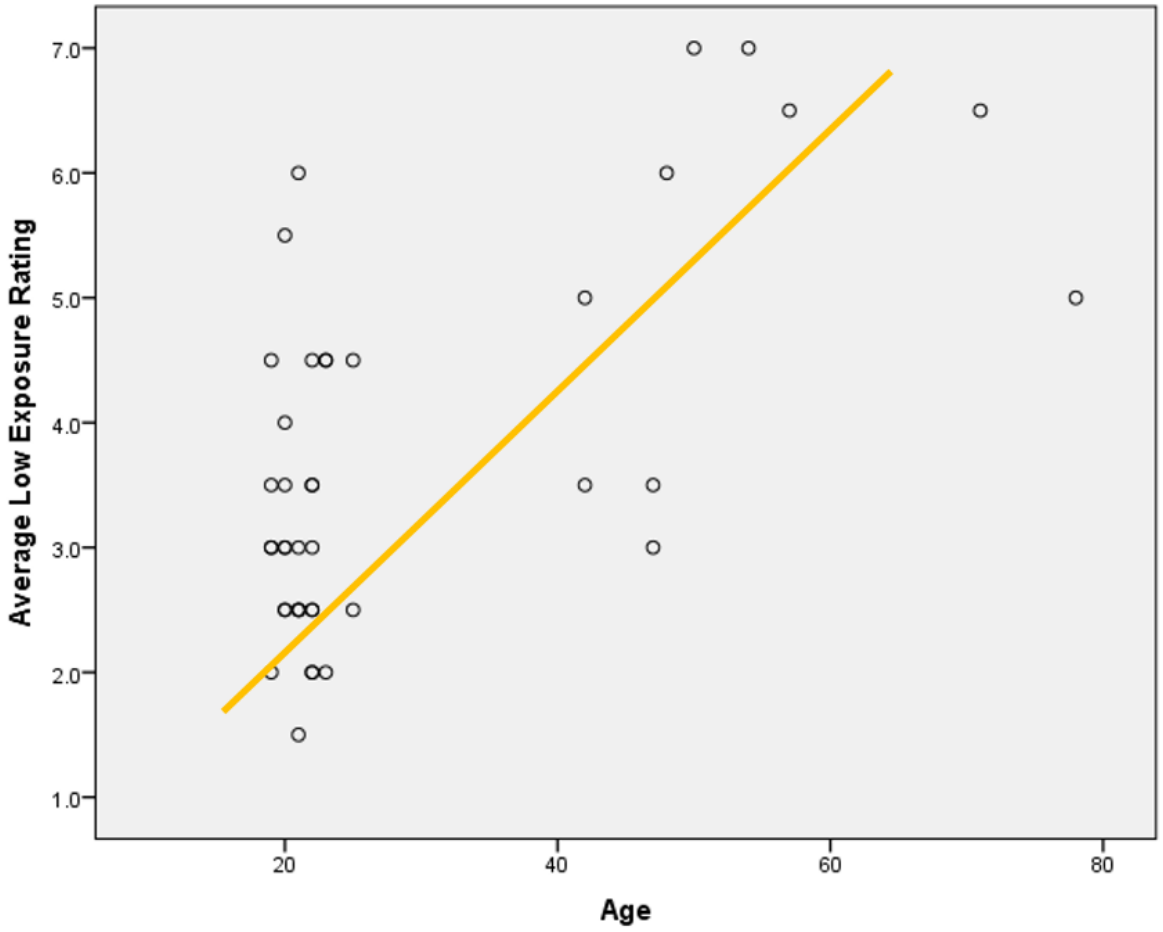

Figure 5. Age and low exposure correlation scatterplot with best-fit line.

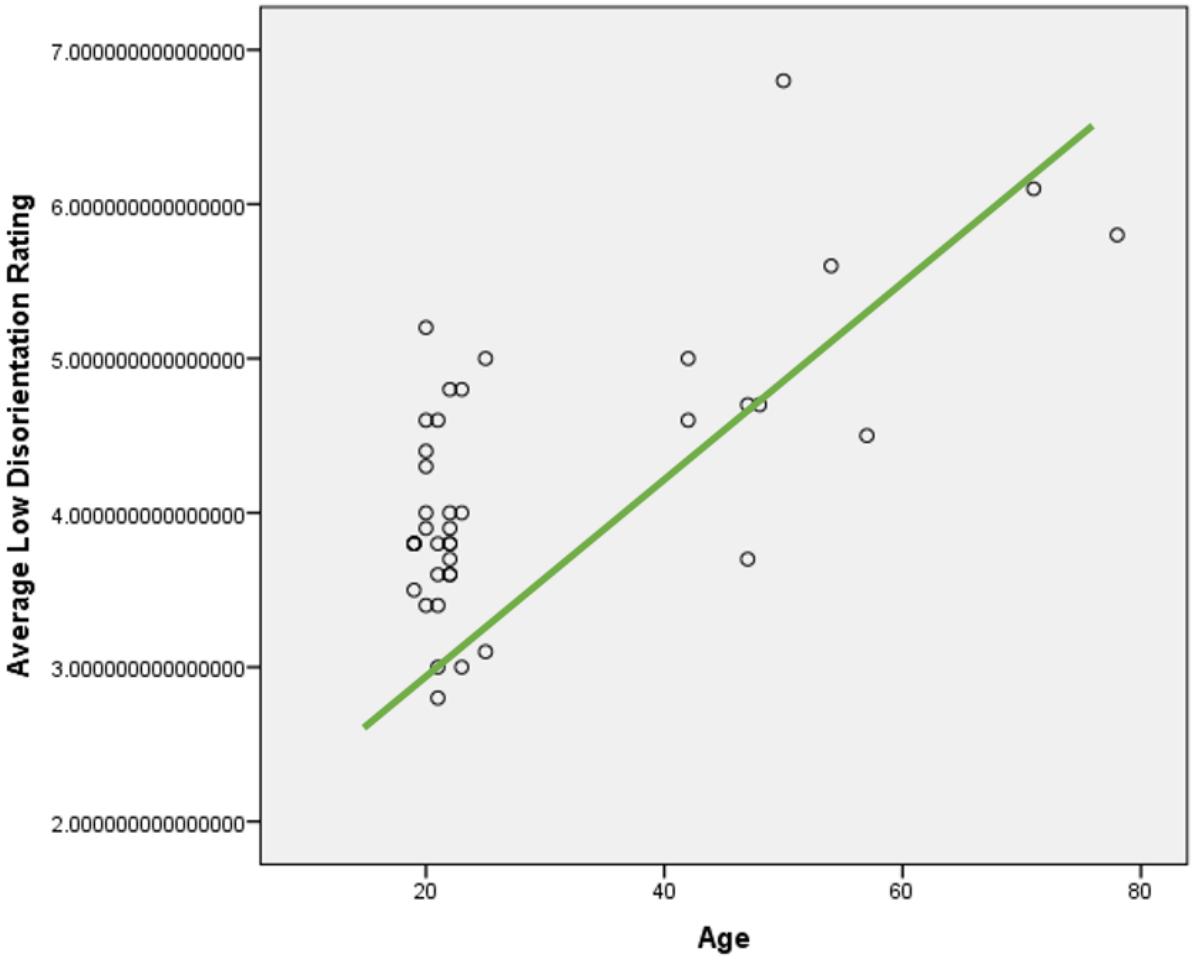

Figure 6. Age and low disorientation correlation scatterplot with best-fit line.

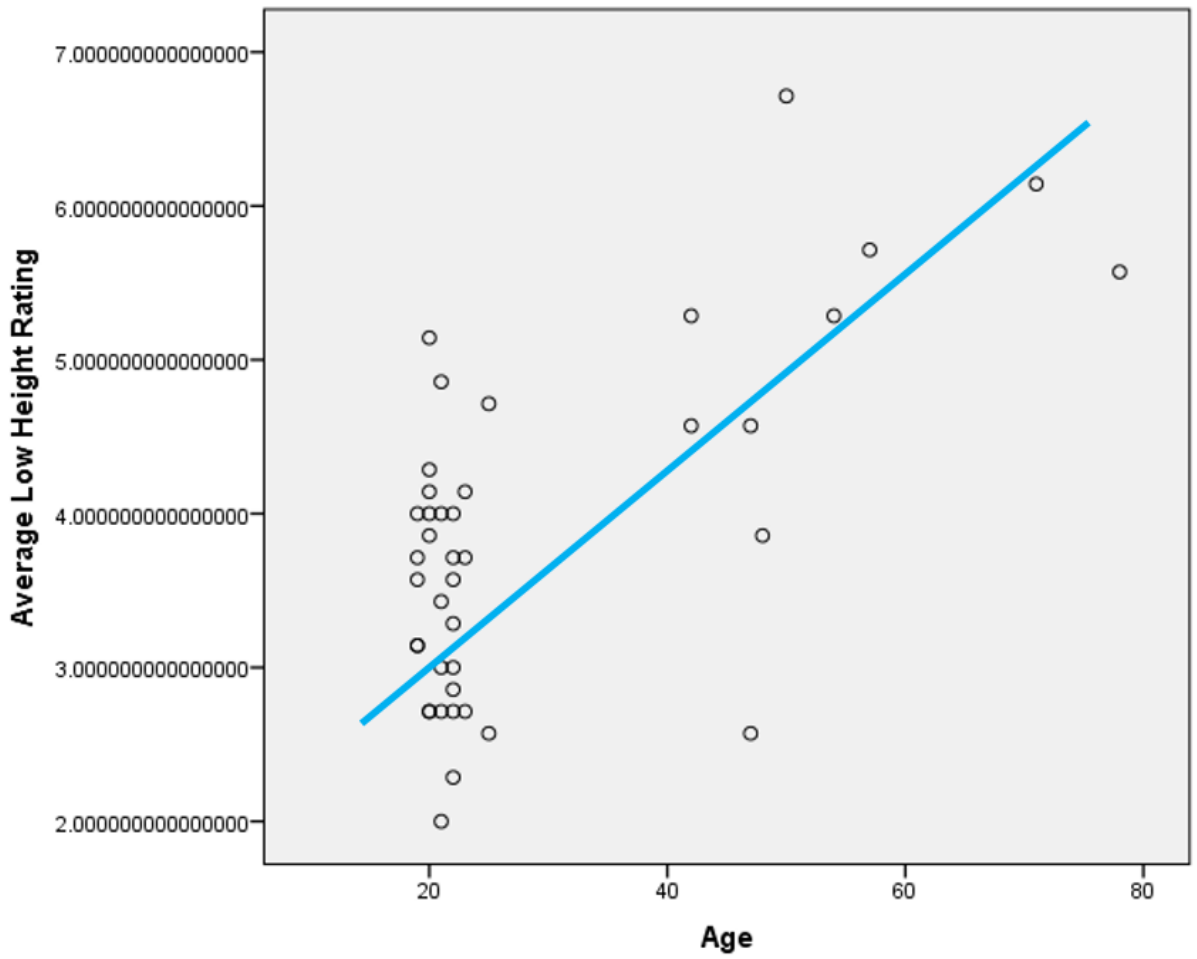

Figure 7. Age and low height correlation scatterplot with best-fit line.

At this point it is necessary to examine the correlation between age and the preference for rides with low elements (specifically water) because it is an unusual case. While the other 4 factors produced highly significant p-values of 0.000 and R-values consistently over 0.6, the p-value from the correlation between age and low-element rides was 0.013 and the R-value was only 0.384. While this is still significant at the 0.05 alpha level, the correlation is both less significant and weaker than the other 4 factors. The implications of this outcome become clearer when examining the scatterplot, shown below:

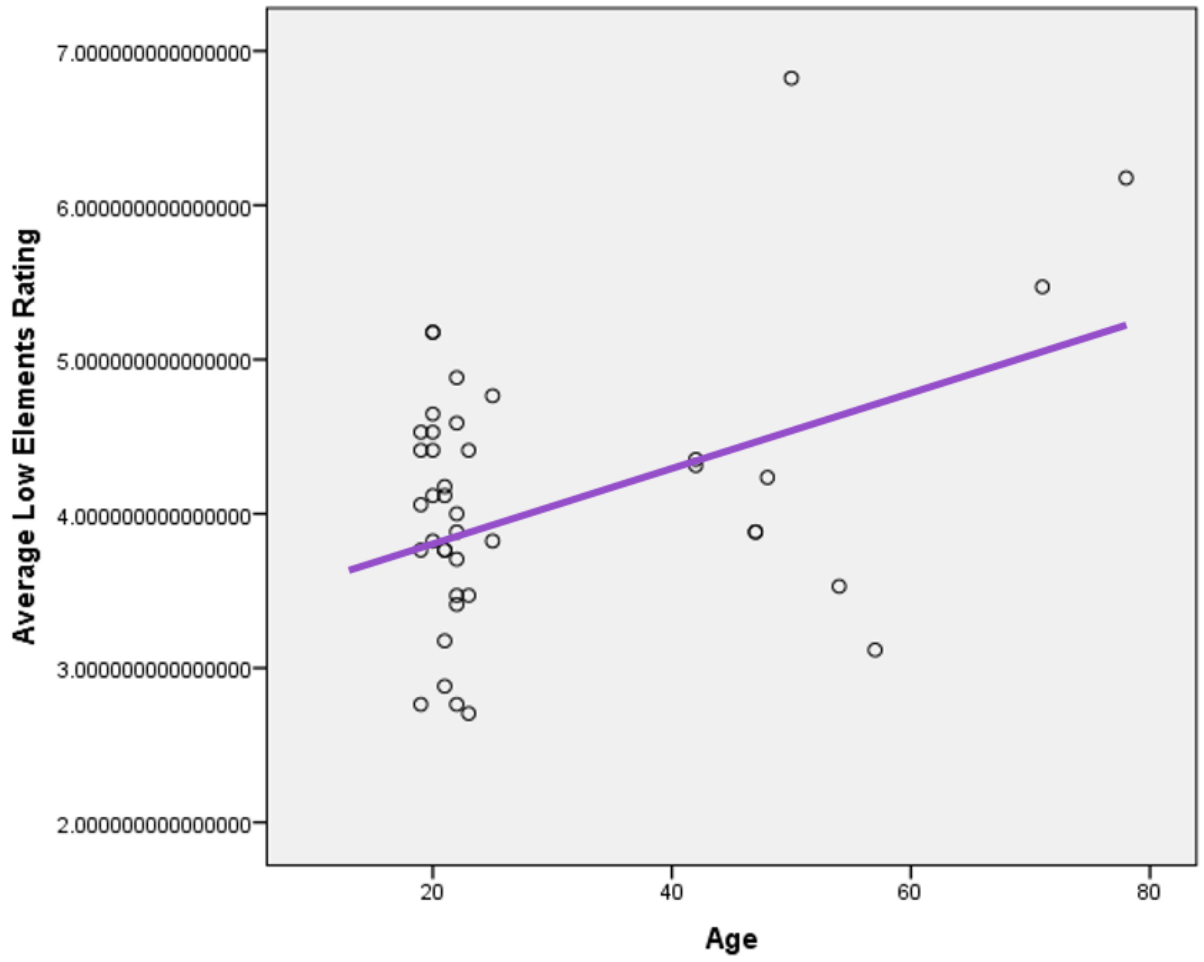

Figure 8. Age and low elements correlation scatterplot with best-fit line.

As is obvious, the trend is not nearly as apparent as it is in the scatterplots of the other four factors shown on the previous pages. In fact, it appears that some of the more extreme values are actually skewing the best-fit line upwards, creating what might be an erroneously high significance. However, this outcome can be explained by a shortcoming of the study. While there was a wide range of rides that met the high and low conditions for speed, exposure, disorientation, and height, water rides are far less common in theme parks. For this reason, out of the 19 rides included in the survey, only 2 included water at all (specifically the log flume ride

and river rapids ride). This is problematic because the number of rides influencing the elements data points are severely lacking. If more water rides were included in the survey, it is possible that this flaw could be corrected.

Discussion

In conclusion, the hypothesis for this study was partially proven and partially disproven by the results. In the correlation between age and preference for low-stimulation rides, the hypothesis was confirmed. There was a strong and significant correlation, which indicated that the older participants were far more likely to be interested in riding a low-stimulation ride than the younger participants. In fact, 90% of participants over the age of 40 wanted to ride the low-stimulation rides, while roughly 60% of the participants under the age of 40 did not want to ride them.

However, in contrast to the initial hypothesis, there was no significant correlation between age and preference for high-stimulation rides. The participants' opinions of high-stimulation varied widely independently of age, and there was no age-related trend in the data. When looking at the scatterplot of age vs preference for high-stimulation rides, there is no visible trend at all.

Furthermore, the individual factors that influence the level of stimulation (e.g. speed, exposure, disorientation, height, and elements) exhibit the same relationship with age as is seen in the overall stimulation data. There is a strong and significant correlation between age and preference for low-speed, low-exposure, low-disorientation, low-height, and low-elements rides, and there is no significant correlation between age and preference for rides with high levels of these factors.

The implications of these findings are huge for the theme park industry. The insight that this study provides into the preferences of different age demographics can be applied to theme park construction, renovation, and targeted marketing. By catering to all age demographics within the same theme park, the industry can expand its user base and bring in more revenue. This study and future studies in the same vein could inform and expedite the process of creating theme park environments that are pleasing for all guests.

In terms of shortcomings, this study could be improved in a number of ways. First of all, the number of rides in the survey with high levels of elements (e.g. water rides) could be increased. Secondly, the study's sample could be improved. This could be accomplished by increasing sample size (finding more participants), using a more random sampling method to eliminate issues related to convenience sampling, and particularly by improving the age distribution of the participants. For a study that uses age as one of its most important variables, the age distribution was lacking; the mean age of the participants was 29, with 31 participants younger than 40 years old and only 10 participants older than 40 years old.

There are several ways that future research could build on this study, either by overcoming the aforementioned shortcomings, or by delving deeper into the subject matter. One potential avenue for further investigation is the specific reasons behind the results. It would be interesting to examine the thought process behind the younger participants' dislike for low-stimulation rides and the older participants' appreciation for those same rides. Do younger participants dislike low-stimulation rides because they are too boring, because they are too childish, or because of some other reason? Do older participants like these same rides because they are more comfortable, because they are nostalgic, or is their preference due to another

unknown cause? Further studies may reveal the answers to these questions and uncover still more information that will benefit the theme park industry.

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