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The effects of casino proximity and time on poverty levels in New York City

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The effect of casino proximity and time on poverty levels in New York City examines levels of poverty over a 5-year duration for urban casino communities under the theoretical dimensions of exposure and adaption. Links between casino proximity and problem gambling or other gambling-related problems that could adversely impact individuals in disadvantaged communities were reported before the influx of urban casinos in major metro areas. This analysis uses Public Use Microdata Samples (PUMS) from the American Community Survey (ACS) estimates. A two-way factorial ANOVA measured poverty-level outcomes at high and low casino proximity in year 1 and year 5 after an urban casino had been opened. No significant interaction was found between casino proximity and year for poverty-level outcomes. The hypothesis that levels of poverty defined as PUMS score in urban casino communities and two levels of casino proximity in the New York metro area for the first and fifth year after the casino had been opened would not report statistically significant changes was supported. Higher poverty-level outcome scores were reported at closer distances measured as high casino proximity with approximately the same reported scores for year 1 and year 5, suggesting that closer distances to a casino despite the lifespan of the casino could influence poverty levels and other potential socio-economic factors. Contextualizing the findings in the exposure and adaptation theory frameworks suggests that exposure to a casino can have adverse consequences based on the increase in poverty-level outcome scores. Conversely, adaptation, which could occur over time, typically at the 5-year mark of operation, was not indicated due to the negligibility of poverty-level scores between year 1 and year 5; thus, refuting adaptation theory. This research expands the literature on urban casino proximity in the context of exposure and adaptation theory. Implication of these results provide the broader community of legislators, community workers, scholar-practitioners, preventionists, and industry with a better understanding of the phenomenon, and any potential adverse consequences to host and neighboring communities so that policy, intervention, prevention, and treatment can be implemented well before a casino opens.

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Introduction

Casino gambling, once an undesirable activity, is now recognized as a socially *acceptable* adult activity in mainstream America (Ashley and Boehlke, 2012; Kerber et al., 2015; Martin et al., 2011; Moore et al., 2011; Stansbury et al., 2015; Thomas et al., 2011; Tolchard, 2015). Following years of relaxed gambling rules, regulations, and expansion, gambling outlets and opportunities have increased, such that casinos have opened in major metropolitan cities throughout the United States (Conway, 2015; Tolchard, 2015), making casino gambling also *accessible* and *available*. In addition, years of consistent gambling deregulation and casino expansions, introduced the *urban casino* (Conway, 2015; O'Gilvie, 2022) and expanded casino gambling to urban cities and local communities.

Originating in Las Vegas in 1931, then onto Atlantic City in 1978 before moving into other rural areas, casinos were typically destinations for many out-of-town patrons or tourists. Traditional destination-style casinos offer full-service amenities, such as several restaurants, nightclubs, spas, and many gaming options ranging from slot machines to dealer table games (American Casino Guide, n.d.; Economopoulos, 2015). In contrast, urban casinos are hosted by major metropolitan cities, offer limited gaming options, and provide minimal amenities. While this newer style of casino primarily serves to increase tax revenues for host states, casino operators and proponents of casinos promote improvements for local economies and communities with promises of increased employment, community development/redevelopment, and tourism (Campbell, 2022).

Several researchers (Griswold and Nichols, 2006; Philander, 2019; Philander et al., 2022; Tolchard, 2015; Tong and Chim, 2013) concur that increased employment, increased tax revenues, reduction of welfare subsidies, sponsorship of local events, improved redevelopment, and tourism, are some positive impacts casinos could make to socioeconomic levels in their host communities, but the sustainability (Lim and Zhang, 2017) of such benefits are also questionable.

Limited urban and regional casino studies indicated that most urban casinos are placed in areas that have an existing culture of gambling (Barnes et al., 2013; Redmond, 2015; Tolchard, 2015; Welte et al., 2016a; 2016b) or where a high vulnerability to gambling disorder is prevalent (Conway, 2015). Hence, the prevalence of increased gambling-related problems could increase in urban locations despite proposed economic improvements. Therefore, the expectations of sustainable economic improvements in urban casino communities could be challenging (Conway, 2015; Lim and Zhang, 2017; Philander, 2019; Tolchard, 2015).

In contrast, casino critics, opposers and even residents understand that a symbiotic relationship between casinos and local and neighboring communities could potentially increase problem gambling, gambling-related problems, or other gambling-related harms (Conway, 2015; Johnstone and Regan, 2020; Philander et al., 2022). According to Johnstone and Regan (2020), gambling-related harms are diverse and could have severe socioeconomic consequences, such as economic distress, homelessness, mental disorders, health issues, and domestic violence (Ariyabuddhiphongs, 2012; Conway, 2015; Philander et al., 2022; Stansbury et al., 2015), regardless of economic promises.

Despite these opposing viewpoints, urban casinos are on the rise. This trend which deviates from casinos moving into traditional rural locations, is expected to continue as more urban cities host casinos in local communities (Conway, 2015). For example, along the northeast megalopolis, three major urban cities—New York City (NYC), Philadelphia, and Baltimore/Washington, D.C., collectively opened seven casinos from 2004 to 2012. While the rapid expansion of urban casinos continues in the United States, research on this phenomenon is still limited even though there has been a marked increase in gambling studies. In 2016, Hodgins and Petry posited that "authors" had difficulty in securing available funds. However, other researchers (Cottler et al., 2016) disagreed and asserted that gambling research funds and grants were indeed available and have been available specifically from the National Center for Responsible Gaming (which is now the International Center for Responsible Gaming, IGRC). Nevertheless, according to Hodgins and Petry (2016), a "collaboration of industry, government and other stakeholders with academic researchers is a contentious issue" where gambling research is concerned but concur that funding was available in Australia, Canada, New Zealand, and the United States (p.1517).

As urban casinos continue to populate the northeast corridor, few studies have begun to contextualize how urban casinos relate to long-standing gambling problems and gambling-related harms. In a Philadelphia case study that focused on the vulnerability of problem gambling in commercial casinos in Philadelphia, the first major urban casino market in the northeast, the impact proximity of urban casinos had on the local neighborhoods was examined (Conway, 2015). The results indicated that three urban casinos in Philadelphia were close to areas where individuals were vulnerable to problem gambling (Conway, 2015) and consistent with previous proximity studies, which indicated a relationship between casino proximity and problem gambling or gambling-related problems (Ariyabuddhiphongs, 2012; Conway, 2015; Martin et al., 2011; Welte et al., 2016a; Welte et al., 2016b). Still, there needs to be more understanding of the relationship between urban casinos' host and neighboring communities and socioeconomic factors, given the proximity of those casinos.

When the three As (acceptability, accessibility, and availability)—ecological predictors of urban casino gambling (O'Gilvie, 2022) were discussed in a literature review that examined the relationship between proximity of urban casinos and their impact on northeast urban communities, associations were found when the construct casino proximity was operationalized as casino accessibility and casino availability in studies that examined problem gambling or gambling-related problems (Ariyabuddhiphongs, 2012; Conway, 2015; Martin et al., 2011; Welte et al., 2016a; 2016b). However, there is still limited research on urban casino proximity since literature in the field was conducted before urban casinos graced the ecological landscape in major metropolitan cities.

From the early 2000s, several metropolitan cities started to host urban casinos, many of which were attached to an existing mode of gambling, such as a racetrack. The hybrid racetrack casino, or *racino*, mainly offers electronic gaming machines (EGM) slot machines, while some only operate video lottery terminals (VLTs) based on the classification and regulations of the host state. Three major urban northeast corridor cities, NYC, Philadelphia, and Baltimore, host urban casinos, but only NYC hosts a racino, or a pari-mutuel casino, Resorts World New York City (RWNYC), which is attached to the Aqueduct Racetrack, and operates only VLTs regulated by The New York State Lottery Division (American Casino Guide, n.d.; O'Gilvie, 2022; Turner et al., 2018).

RWNYC is NYC's only casino and stands alongside the Aqueduct Racetrack in Queens. Nevertheless, casino revenues reported in the inaugural year of operations outranked its northeast corridor urban casino counterparts in Philadelphia and Baltimore, Atlantic City casinos, and the two tribal casinos in Connecticut (Bagli, 2012). With several access points and modes of transportation, RWNYC could quickly recapture all the local communities traveling to Atlantic City or Connecticut (Bagli, 2012) for casino participation. Undoubtedly, RWNYC is a "convenience casino", but with considerable expansions to the property, RWNYC currently boasts three floors of slot machines, restaurants, access to the Aqueduct Racetrack, and a recently added adjoining Hyatt hotel.

Even after closing during the 2020 pandemic, the NYC casino market where RWNYC resides saw revenues that remained in the top 10 of the *American Gaming Association's Top 20 U.S. Commercial Casino Markets* list ([AGA], American Gaming Association 2022). At year-end 2020, the NYC casino market ranked eighth, recording revenues of $658 M but quickly moved into sixth place at the year-end of 2021 with an increase in revenue to $1.46B (AGA, 2022). The Baltimore-Washington, D.C., commercial casino market, which hosts the lavish MGM National Harbor, and two urban casinos (Live Casino and Horseshoe Casino in Baltimore), outranked the NYC casino market at fourth place with reported revenues at $2.00B (AGA, 2022). RWNYC continues to report impressive annual revenues as NYC's only urban casino, yet it is unclear how the host and neighborhood communities have fared since RWNYC opened its doors in 2011.

Talks and negotiations to open more casinos in metro NYC continue, and RWNYC remains one of the top contenders spending millions of dollars courting politicians and lobbyists to secure one of the three available permits (Campbell, 2022). This permit is not necessarily for another casino; instead, RWNYC's goal with one of the permits is to convert RWCNYC from a racino to a full-scale casino, like those found in Las Vegas and Atlantic City (Campbell, 2022). According to Campbell (2022) when RWNYC was asked why the pursuit of a full-scale casino was in consideration, the spokesperson touted a successful tenure where the casino has a "proven track record" of proving jobs, supporting local businesses and nonprofits, and helping to fund public schools. Therefore, expanding RWNYC could potentially expand employment opportunities and educational benefits as well as increase revenues for the casino.

Whether past improvements have translated into sustainable positive socioeconomic outcomes for the host and neighboring casino communities of RWNYC, it is unknown due to the paucity of research on urban casinos and how the proximity of urban casinos impacts the socioeconomic status of local communities; therefore, more research is needed. A thorough understanding of this phenomenon could provide data for all stakeholders, including policymakers, social services organizations (SSOs), human services professionals, scholars, and industry.

This article focuses on the proximity of one urban casino, RWNYC, in the New York metro area and one socioeconomic factor, poverty levels. As far as it is known, there has been no evaluation of the proximity to RWNYC and how local communities are affected. Using the lens of exposure and adaptation theories (LaPlante and Shaffer, 2007; Shaffer et al., 2004) to underpin this evaluation, this study aims to determine whether the injection or adoption of an urban casino in a major metropolitan city such as NYC saw any changes or differences in poverty levels based on the measure of proximity to/from the casino from years one through five after the casino opened.

The perspectives of exposure and adaptation theories were sufficient to evaluate this investigation since exposure theory suggests that initial *exposure* to casinos (as an environmental toxin) could infect (Shaffer et al., 2004) casino patrons and local communities and consequently result in adverse socioeconomic outcomes. Adaptation theory, the competing and complementary theory, posits that over time, with *adaptation*, the casino could lose its novelty (or the toxin diminishes) and patrons and local communities adapt to the casino environment and structure (LaPlante and Shaffer, 2007; Philander, 2019; Philander et al., 2022; Prentice and Zeng, 2018). Results from this study would inform the literature on urban casino proximity in the context of exposure and adaptation theory.

Methods

Publicly available poverty-level data defined as Public Use Microdata Samples (PUMS) from the American Community Survey (ACS) ([United States Census Bureau], "Census.gov", n.d.) 2012–2016 estimates were collected and used to address the research question. The construct casino proximity was operationalized as a two-level categorical independent variable. Year represented the second independent variable, and poverty levels, defined as PUMS scores, served as the dependent variable. The research question and related null and alternate hypotheses were:

RQ: Are there significant differences/changes in poverty levels defined in PUMS in urban casino communities based on two levels of casino proximity in the New York metro area for the first and the fifth year after the casino has been opened?

H_0 (null): Levels of poverty defined as PUMS score in urban casino communities and two levels of casino proximity in the New York metro area for the first and the fifth year after the casino had been opened will not report statistically significant differences/changes.

H_a (alternate): Levels of poverty defined as PUMS score in urban casino communities and two levels of casino proximity in the New York metro area for the first and the fifth year after the casino had been opened will report statistically significant differences/changes.

The research question examined the interaction between two categorical variables (casino proximity and year) and one continuous variable (average PUMS score). Therefore, the research question examined whether there were significant differences/changes in poverty levels defined in PUMS in urban casino communities based on two levels of casino proximity in the New York metro area for the first and the fifth year after the casino was opened. Specifically, whether people who lived close to the casino had higher levels of poverty than those who lived further away from the casino at year 1 (in line with exposure theory) and whether those significant differences in poverty levels between those who lived close or distant from the casino had dissipated at year 5 (in line with adaptation theory). The research question also established whether an association existed between each independent and dependent pair, so a two-factor or two-way ANOVA was appropriate (Field, 2013; George and Mallery, 2014; Laerd Statistics, 2017).

Two-way factorial ANOVAs are useful for analyzing the moderation effect between independent variables (casino proximity and year); if the interaction between the variables is significant, moderation is present (Field, 2013a). Because there were no relationships between the observations in each categorical group (casino proximity and year) (Laerd Statistics, 2017), the two-way ANOVA met the initial assumptions to proceed with hypotheses testing. If the p values for the dependent variable were $p < 0.05$, the null hypothesis would be rejected.

Casino proximity. As a construct found in gambling research, existing literature revealed no clear definition of casino proximity. The National Gambling Impact Study Commission reported in its nationally conducted study that casinos located 50 miles from individuals' homes contributed to gambling-related problems (Gerstein et al., 1999, p. 10; Welte et al., 2016a, p. 2). Another study reported that 10 miles from individual homes indicated a likelihood of gambling-related problems (Welte et al., 2004), while Tong and Chim (2013) in their systematic review found that the lack of a standard definition, measurement, or tool to define casino proximity, resulted in the terms "high" and "low" casino proximity that varied across several of the studies analyzed in the review. An early study by Griswold and Nichols (2006) found that when casino proximity was defined as >15 miles from a Metropolitan Statistical Area (MSA), the size of casino proximity decreased and became statistically insignificant (p. 390).

Travel time or distance used by individuals or a population to get to a casino was also used in studies that defined casino accessibility and casino proximity (Conway, 2015; Robitaille and Herjean, 2008). Some studies defined casino proximity as "the physical distance or driving distance between [participant's] residing home and nearest casino" (Tong and Chim, 2013, p. 4; Welte et al., 2004), while other studies indicated that the distance between casino gambling venues and individuals' homes varies by researchers' definitions of casino proximity (LaPlante and Shaffer, 2007; Tong and Chim, 2013), but as previously indicated, many of those studies were conducted before the vast influx of urban casinos or racinos (Tong and Chim, 2013; Welte et al., 2016a; 2016b). According to several researchers (Tong and Chim, 2013; Welte et al., 2016a, 2016b; Welte et al., 2004), exposure to casinos within the 30-mile proximity indicated a higher prevalence of problem gambling, which could affect socioeconomic indicators such as income and poverty levels.

Given existing literature, the research question and related hypotheses, and the lack of quantitative studies on urban casino proximity, this research defined casino proximity as a two-level categorical variable (high casino proximity and low casino proximity), operationalized to measure the physical distance in miles to/from the urban casino RWNYC up to a 50-mile radius, which is consistent with existing literature in the field (Gerstein et al., 1999; Griswold and Nichols, 2006; Tong and Chim, 2013; Welte et al., 2016a; 2016b).

Poverty levels. The influx of casinos as a relatively new urban neighborhood phenomenon in the northeast has not explicitly been correlated to proximity and poverty levels. According to the United States Department of Agriculture Economic Research Center (USDA ERC), "Concentrated poverty contributes to poor housing and health conditions, higher crime and school dropout rates, and employment dislocations" (n.d., para. 1). Previous gambling studies that examined the socioeconomic impacts of casino communities were focused on employment, income, bankruptcies, crime, and tax revenues (Barnes et al., 2013; Goss et al., 2009; Lim and Zhang, 2017; Walker and Sobel, 2016), and many of those studies occurred before the influx of urban casinos in major metro areas.

To understand the rationale for measuring poverty levels at year 1 and year 5 after an urban casino had been opened in NYC, exposure and adaptation theories (LaPlante and Shaffer, 2007; Philander, 2019) underscored this investigation. Specifically, the perspectives of exposure theory were tested after the casino had been opened 1 year to determine whether poverty levels would be higher in year 1 due to exposure; then, over time, at the 5-year mark, adaptation theory would be tested to determine if those casino communities (as the units of analysis), would have gradually adapted, or developed a resistance to the exposure of the casino. This adjustment period (Philander, 2019; Philander et al., 2022; Prentice and Zeng, 2018) has not been fully explored in the literature, but Welte et al. (2017) posited that casinos realize positive economic benefits for ~5 years after opening before revenues begin to flatten or decrease; therefore, adaption to the casino could be expected to occur.

Sample. The sample was identified as urban casino communities in the New York metro area within a 50-mile radius of RWNYC. Therefore, the units of analysis were urban casino communities' zip codes (aggregated), selected from two distances to/from RWNYC as high casino proximity representing up to 30 miles to/from the casino and low casino proximity measuring 31–50 miles to/from the casino. PUMS data which contained poverty levels estimates for 2012–2016, originally collected from the ACS 14-page questionnaire responses ("Census.gov," n.d.) were selected from those urban casino communities using Google Maps (Google Maps, n.d.) and the United States Zip Code Database (United States Zip Codes, n.d.) to measure distances and to identify relevant zip codes to/from the urban casino, RWNYC, respectively.

According to the Unites States Census Bureau ("Census.gov," n.d.a.), the ACS 14-page questionnaire collects data at the single-person unit or at the single housing unit (household-level data set). Data in the ACS Summary Files include and cover social, economic, housing, and demographic subjects. ACS responses are highly confidential, and confidentiality is protected by modifying some variables in PUMS files ("Census.gov," n.d.). ACS data are aggregated and reported in the PUMS files, which can be downloaded directly from the Census Bureau website.

Since secondary data were used for this study, calculation of sample size was not required unless the secondary data did not meet the minimum calculation for a power analysis. To examine the interaction and the associations between casino proximity and poverty-level outcomes in urban casino communities in metro New York, a 95% confidence interval (*CI*) level was used, and a p value < 0.05 was considered significant (Fields, 2013). Because this study's statistical model used a two-way ANOVAs (Faul et al., 2009), a power analysis was conducted to determine sample size using G*Power computer program (Faul et al., 2007), which indicated that a total sample of 158 jurisdictions would be needed to detect medium effects ($f = 0.25$) with a power level of 0.80 using an ANOVA between means with alpha at 0.05. This is consistent with factors that influence power, which are sample size, alpha level, and effect size.

Zip codes from Queens County and neighboring NYC counties (Kings, Bronx, Manhattan, and Richmond) were identified within the two specified distances from the casino. Additional New York counties, including Nassau, Suffolk, Rockland, and Westchester counties, were also identified and selected. To reach beyond NYC and to cover the 31 to the 50-mile radius (low casino proximity), counties in New Jersey (Bergen, Middlesex, and Monmouth) and Connecticut (Fairfield) were identified. This sampling plan yielded 518 zip codes within the 50-mile radius of RWNYC.

Because 11 cases reported zero population and zero PUMS values, they were deleted by listwise deletion (Kang, 2013). Nine cases and 2 cases at the high casino proximity and two at the low casino proximity, respectively, were verified on the United States Zip Code Database, and were found to be unique zip codes (such as colleges or universities), post office boxes, other institutions such as nursing homes, or very small land areas without populations, and consistent with the Census definition of individuals for whom poverty cannot be determined (U.S. Census Bureau, 2022). The American Fact Finder database[1] further verified the cases before removal. There were no missing cases or incomplete data included in this sample.

The final sample ($N = 507$) used for the statistical analysis was 300 at high casino proximity and 207 at low casino proximity (Table 1). PUMS data for each zip code by year were organized in a data table in Microsoft® Excel, with the rows representing data for each zip code by year and the columns representing the independent variables (casino proximity and year) and the dependent variable (PUMS scores). Once all the variables were recoded and organized to ensure anonymization, the data sets were imported into an IBM® SPSS® (version 24) data (*.sav) file for statistical analyses (Field, 2013; George and Mallery, 2014; Laerd Statistics, 2017).

Results

A two-way factorial ANOVA was performed to examine the interaction between the variables, specifically whether there were significant differences/changes in levels of poverty operationalized as average PUMS scores in NYC urban casino communities at two levels of proximity for the first and the fifth year after the casino had been opened.

The two-way ANOVA met the first three assumptions, with one continuous dependent variable (PUMS score), two categorical variables (casino proximity and year), and independence between the groups such that there were no relationships for each categorical group used (George and Mallery, 2014; Laerd Statistics, 2017). Residual analysis was performed to test the assumptions of the two-way ANOVA, namely, identifying significant outliers, normality, and homogeneity. Outliers were assessed by inspection of a boxplot, the assumption of normality was assessed using Shapiro–Wilk's normality test for each cell of the design, and Levene's Test of Equality of Error Variances assessed the assumption of homogeneity of variances (Field, 2013).

The boxplots identified several outliers in the studentized residual (SR) column created in SPSS®, which could be due to data entry errors, measurement errors, or an extreme case such as "genuinely usual values" (Laerd Statistics, 2017). Without adequate justification to modify the outliers, those outliers were removed, and the two-way ANOVA test was repeated, omitting outliers. Both two-way ANOVAs (with and without the outliers) resulted in the same conclusions to be drawn, with no statistically significant interaction effect ($p > 0.05$); therefore, the outliers were maintained in the analysis. Furthermore, removing the outliers would have reduced the observations by approximately one-third.

Table 1 Descriptive Statistics.

Dependent Variable: PUMS Score

Casino Proximity	Year	Mean	SD	*N*
High Casino Prox.	2012	5504.64	7641.537	300
	2016	5508.867	7645.663	300
	Total	5506.753	7637.218	600
Low Casino Prox.	2012	1319.275	2287.153	207
	2016	1398.971	2385.875	207
	Total	1359.123	2334.545	414
Total	2012	3795.823	6393.355	507
	2016	3830.862	6399.104	507
	Total	3813.342	6393.097	1014

The residuals were not normally distributed as reported in Shapiro–Wilk's test; thus, the assumption of normality was violated ($p = 0.000$, $p < 0.0005$) (Table 2).

Options to handle the violation included transforming the dependent variable, proceeding with the analysis, or performing a more robust analysis. Since the nature of the ANOVA assumes "robustness," the two-way ANOVA could handle this violation. Alternative, more robust analysis was not an option in SPSS®, which did not have the capability (Laerd Statistics, 2017). Hence, the decision to proceed despite the violation of normality was maintained.

Levene's Test of Equality of Error Variances reported $p < 0.001$, heterogeneous variances, so the assumption of homogeneity of variances (Table 3) was violated. When dealing with heterogeneous variances or violation of homogeneity, the options include transforming the data, performing robust analysis, performing weighted least squares regression, or carrying on with the ANOVA. Because the two-way ANOVA is robust when dealing with heterogeneous variances, no other test was required (Jaccard, 1998, as reported in Laerd Statistics, 2017); thus, the two-way ANOVA proceeded with the heterogeneous variances.

Interaction effect. The interaction effect between casino proximity and year on PUMS scores (poverty levels) reported $F(1, 1010) = 0.009$, $p = 0.933$, partial $\eta\ 2 = 0.000$, not statistically significant; thus, not rejecting the null hypothesis. Even though the null hypothesis is not rejected, this result does not necessarily suggest that there is no evidence of an interaction effect, but this result shows that the effect of casino proximity on poverty-level outcomes was about the same for year 1 and year 5.

Since there was no interaction effect, simple main effects were considered as one (Laerd Statistics, 2017) so that an overall measure of the effect of casino proximity on poverty levels ignoring year was analyzed. When the simple main effects were averaged to achieve a main effect, the result of the analysis of the main effect for casino proximity indicated that the main effect was statistically significant $F(1, 1010) = 114.45$, $p < 0.001$, partial $\eta\ 2 = 0.102$ (Table 4).

Based on an examination of the profile plots which were required to report main effects, the interaction between casino proximity and mean PUMS scores based on year was not statistically significant, hence an ordinal interaction, while the lines for casino proximity for year 1 and year 5 were parallel but crossed, indicating a disordinal interaction. This confirmed the previous tests, no statistically significant interaction between casino proximity and year on average PUMS scores, $F(1, 1010) = 0.009$, $p = 0.922$, partial $\eta\ 2 = 0.000$, not rejecting the null, and statistical significant main effect for casino proximity ignoring year, $F(1, 1010) = 114.45$, $p < 0.001$, partial $\eta\ 2 = 0.102$, rejecting the null.

An analysis of the main effect for year was performed, which indicated that the main effect for year was not statistically significant $F(1, 1010) = 0.012$, $p = 0.914$, partial $\eta\ 2 = 0.000$.

Table 2 Shapiro–Wilk's Test of Normality with Residuals for PUMS Scores.

			Shapiro–Wilk's		
Casino Proximity	**Year**		**Statistic**	**df**	***Sig.***
High (0)	2012	Residual for PUMS Score	0.711	300	0
	2016	Residual for PUMS Score	0.707	300	0
Low (1)	2012	Residual for PUMS Score	0.507	207	0
	2016	Residual for PUMS Score	0.519	207	0

0 = High Casino Proximity; 1 = Low Casino Proximity.

Since there was no statistically significant main effect of year on PUMS score, $F(1, 1010) = 0.012$, $p = 0.914$, partial η 2 = 0.000, the marginal means between year 1 and year 5 for PUMS scores were reported (Table 5). The difference in mean PUMS scores between year 1 and year 5 was run where 95% *CI* and *p* values were Bonferroni-adjusted. Year 1 was associated with a mean PUMS score −41.96, 95% CI [−802.73, 718.80], lower than year 5, with no statistically significant difference, $p = 0.914$ (Table 5).

Results indicted a significant main effect such that those who lived closer to the casino has significantly higher levels of poverty than those who lived further away at both year 1 and year 5. This finding supports exposure theory but not adaptation theory.

Discussion

The results indicated no statistically significant interactions between casino proximity and poverty-level outcomes ($p = 0.922$) between years 1 and 5. High casino proximity was associated with higher PUMS scores (average poverty levels), as compared to low casino proximity, a statistically significant difference ($p < 0.001$). Thus, the null hypothesis (H_0) was not rejected, and the alternate hypothesis (H_a) was not accepted. The main effect of casino proximity on poverty-level outcome scores was higher for those communities closer to the RWNYC and statistically significant ($p < 0.001$), which indicated that closer distances to casinos could potentially have adverse socio-economic outcomes, which could lead to poverty. This finding is consistent with previous casino proximity studies within the high casino proximity range (up to a 30-mile radius) that reported links between casino proximity and problem gambling and other gambling-related problems (Conway, 2015; Tong and Chim, 2013; Welte et al., 2016a; 2016b).

Year was an important variable for the present investigation and an important construct for the underlying theoretical framework of exposure and adaptation theories (LaPlante and Shaffer, 2007; Philander, 2019; Prentice and Zeng, 2018), therefore including an analysis that investigated the effect of year on casino proximity and levels of poverty was relevant. Year one was associated with a mean PUMS score of −41.96, 95% CI [−802.73, 718.80], lower than year 5; hence, no statistically significant difference, $p = 0.914$, suggesting that the effect of casino proximity levels on poverty-level outcomes (aggregated PUMS scores) was marginal for years 1 and 5. While this result suggests an association between the variables, the findings were unexpected, particularly when interpreted under the lens of exposure and adaptation theories.

For example, literature on the theories of exposure and adaptation seems to support the assumption that year 1 would see higher levels of gambling participation due to the initial exposure to the new environmental change (a new casino), which could increase gambling-related problems. By year 5, when some level of adaptation to the casino is expected, gambling participation could potentially see a decline, and consequently, gambling-related problems could also decrease (Economopoulos, 2015; LaPlante and Shaffer, 2007; Philander, 2019; Prentice and Zeng, 2018; Walker and Sobel, 2016; Welte et al., 2017; Welte et al., 2016a, 2016b; Xouridas et al., 2016). However, the results did not support adaptation theory.

Nevertheless, the results supported exposure theory, suggesting that “initial” exposure to casinos could be environmentally toxic (LaPlante and Shaffer, 2007; Prentice and Zeng, 2018), especially given RWNYC’s first year of reported revenues. However, the

Table 3 Levene’s Test of Equality of Error Variances[a].

Dependent Variable: PUMS Score

F	df1	df2	*Sig.*
81.752	3	1010	0

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.
[a]Design: Intercept + Casino Proximity + Year + Casino Proximity * Year.

Table 4 Tests of between-subjects effects.

Dependent Variable: PUMS Score

Source	Type III Sum of Squares	df	Mean Square	*F*	*Sig.*	Partial Eta Squared
Corrected Model	4214845865.000[a]	3	1404948622	38.157	0	0.102
Intercept	11547969120	1	11547969120	313.633	0	0.237
Casino Proximity	4214185816	1	4214185816	114.454	0	0.102
Year	431328.938	1	431328.938	0.012	0.914	0
Casino Proximity * Year	348811.399	1	348811.399	0.009	0.922	0
Error	37188163270	1010	36819963.63			
Total	56148170040	1014				
Corrected Total	41403009130	1013				

[a]R Squared = 0.102 (Adjusted R Squared = 0.099).

Table 5 Marginal means for year.

Dependent Variable: PUMS Score

(I) Year	(J) Year	Mean Difference (I-J)	Std. Error	*Sig.*[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
2012	2016	−41.961	387.69	0.914	−802.732	718.809
2016	2012	41.961	387.69	0.914	−718.809	802.732

Based on estimated marginal means. I = Year 2012; J = Year 2016.
[a]Adjustment for multiple comparisons: Bonferroni.

results do not indicate a significant interaction between casino proximity and poverty-level outcomes from year 1 to year 5 to support the theoretical foundations of adaptation theory, or the "adaptation effect" (Hodgins and Petry, 2016, p. 1517). Hence, this finding supports exposure theory but not adaptation theory.

Noteworthy is that RWNYC is a racino opened alongside the existing Aqueduct Racetrack that has had a long-standing culture of racetrack gambling, and the location of the Aqueduct Racetrack could have already achieved adaption in terms of horse-racing. Racetrack gambling is inherently different from casino gambling, so even if the racetrack had achieved adaptation, RWNYC was a new casino and a different mode of gambling that has not been examined in studies under the lens of adaptation. The physical location of the casino was used to measure distance (proximity) but the location itself was not a variable in this study. As the first known investigation that utilized both theories concurrently for an urban casino proximity investigation in a major metropolitan city, NYC, the results had appreciable benefits, particularly for future use of adaptation theory in urban casino studies.

Conclusion

Major metropolitan cities along the Northeast megalopolis saw an increase in urban casinos from 2004 to 2016, so accessibility and availability to casinos, two environmental factors that affect casino participation, also increased. Acceptability, the third ecological construct of casino participation, had already evolved due to gambling deregulation, increased gambling revenues, and casino expansion. However, links between the three As and urban casinos' socioeconomic levels have yet to be thoroughly investigated. Previous researchers who explored casino accessibility and availability in the context of casino proximity found a relationship between the construct and problem gambling or gambling disorder (Ariyabuddhiphongs, 2012; Conway, 2015; Martin et al., 2011; Tolchard, 2015; Tse et al., 2012; Welte et al., 2016a; 2016b), but many of those studies occurred before the influx of urban casinos as a new phenomenon (Conway, 2015).

Still, urban casinos are on the rise in the northeast, and casino operators champion improvements to their host and local economies and communities with promises of employment, sponsorships, and educational funding, even though there is little empirical research to support these claims. The trend that more casinos will open in urban cities is imminent and thus indicates future research options since an increase in casinos could also indicate an increase in inequality at lower socioeconomic levels (Redmond, 2015). Moreover, adverse outcomes of urban casino gambling have not been fully explored. Examining the relationship between urban casino communities and socioeconomic outcomes may provide SSOs, human services professionals, and the broader community of legislators, community workers, scholars, and industry with a better understanding of the phenomenon and any potential adverse consequences to host and neighboring communities so that policy, intervention, prevention, and treatment can be considered before a casino is erected.

This research focuses on poverty-level outcomes as one measure of socioeconomic status in urban casino communities in the New York metro area by measuring the distance to/from (proximity) the RWNYC under the lens of exposure and adaptation theories. Results were mixed; the underlying assumption was that average poverty levels might constitute slightly lower rates at the 5-year mark. However, there were no significant changes in poverty levels between years 1 and 5. Hence, exposure to the casino did not significantly affect poverty-level outcomes from year 1 to year 5, which disagrees with the theoretical view of adaptation. Consistent with past research, the urban casino, RWNYC, was added to the long-standing Aqueduct Racetrack, which has had a mode of gambling for decades, so adaptation at that location could have already been achieved and, therefore, could have refuted adaptation theory.

The results supported confirming exposure theory, which reported slightly higher exposure to poverty levels in year 1. High casino proximity was associated with higher poverty levels, consistent with the expected findings that shorter distances to casinos are likely to increase the prevalence of problem gambling and gambling-related problems, which could affect socioeconomic factors such as poverty. This study is the first known urban casino proximity study that used both theories concurrently, indicating a need for more literature or data to support the findings. Although the theoretical findings were mixed, the results were consistent with Prentice and Zeng's (2018) account that gambling exposure and problems associated with increased exposure have not been reported or results have been mixed (Tong and Chim, 2013) and with Philander's (2019) assumption that there is a lack of "well-tested theory" to investigate the relationships between casino exposure and gambling-related problems (such as poverty) in the literature (p. 174).

The study was limited to NYC, a densely populated major metro area in the northeast, and therefore may not represent other major metro areas. Regarding poverty levels in the U.S., the South has historically reported higher poverty levels than the North (USDA ERC, n.d.), so future studies may need to be more generalizable to southeastern urban casino communities. The sample for this study was secondary data obtained from Census self-reporting questionnaires, which is a natural limitation of using secondary data (Greenhoot and Dowsett, 2012) since responses were self-reported, and therefore, bias could be expected.

Despite the limitations, this study contributes to the knowledge pool on the proximity of urban casinos' neighboring communities and poverty-level outcomes for a major metropolitan city in the northeast. Therefore, further quantitative investigations, including longitudinal studies that could examine pre-casino poverty levels using other socioeconomic factors (income, education, and employment/occupation) and demographic variables, such as gender, age, and race, are indicated for researchers, practitioners, legislators, and the casino industry.

Data availability

The author confirms that all data generated or analyzed during this study are included in this published paper. Secondary sources and data supporting the findings of this study were all publicly available at the time of submission.

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Note

1 The Census Bureau ceased operations of the American Fact Finder database on March 31, 2020, so this option is no longer viable.

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Competing interests

The authors declare no competing interests.

Ethical approval

The author confirms that all research was performed in accordance with relevant guidelines and regulations. Ethical approval was obtained from the Institutional Review Board of Capella University.

Informed consent

The author confirms that the present study used publicly available secondary data with strict documented privacy and confidentiality guidelines by the United States Census Bureau; therefore, this paper does not contain any studies with human participants performed by the author.

Additional information

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