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Hazards of Telecommunication Mast Installation in Nigeria: Danger of Non-Compliance with Established Regulations on The Environment: Enugu State Nigeria as A Case Study

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ABSTRACT

The issue of installation of telecommunication mast installation and environmental safety has been a major issue in Nigeria with scholars raising concerns over the safety of the citizens within the country. The study examines various laws governing telecommunication installations in Nigeria to address the perceived shortcomings in the laws. It has been noted with dismay that there are serious environmental hazards associated with the installation of telecommunication masts close to residential premises. Among these are various health issues, cracks in the building, and pollution, such as water, land, and air. The problems also include telecommunication masts falling on buildings and sometimes death due to substandard materials used in the installation as against the stated standard by the controlling regulatory body. The methodology will be both doctrinal and non-doctrinal. The justification for this research is the daily experience of hazards associated with telecommunication mast installations especially when there are cracks in the building as a result of the closeness of the mast to such a building and masts falling on people leading to death because of usage of substandard materials during installation. It will be recommended that to have a safe environment when it comes to telecommunication Installation in Nigeria, there is a need to strengthen the legal frameworks on telecommunication installation in Nigeria by ensuring that these laws are complied with by relevant stakeholders in the telecommunication sector. The study will contribute to the existing knowledge by highlighting environmental hazards associated with telecommunication masts installation close to residential premises and the need to ensure compliance with established laws.

1. Introduction

The Need for environmental protection is non negotiable. Environmental Protection in the area of telecommunication mast installation is the major focus of this research with Enugu State Nigeria as a case study. The paper considers some of the laws put in place to regulate the environment. Scholars have noted with dismay that most of these laws are not obeyed by the relevant stakeholders and this research advocates for improved enforcement of environmental laws in Nigeria. Some of the laws are as are discussed below:

The National policy on the Environment : This was launched by Government on 27th November 1989. This document described guidelines and strategies for achieving the policy goal of sustainable development in Nigeria.

The National Guidelines and Standards for Environmental Pollution Control (Cap This was launched on March 12th 1991 and represents the basic instrument for monitoring and controlling industrial and urban pollution.

National Effluence limitation Regulations of 1991: This instrument makes it mandatory that industrial facilities install anti-pollution equipment, make provision for further effluent treatment, prescribe maximum limit of effluent parameters allowed for discharge and spell out penalties for contravention.

Pollution Abatement in Industries facilities Generating Waste Regulations of 1991: Through this Act, restrictions are imposed hereunder on the release of toxic substances and requirements stipulated

- Monitoring of pollution to ensure permissible limits are not exceeded
- Unusual and accidental discharges
- Contingency plans
- Generator's liabilities
- Strategies of waste reduction and safety for workers

Waste Management Regulation of 1991: This regulates the collection, treatment and disposal of solid and hazardous waste for municipal and industrial sources and gives the comprehensive list of chemicals and chemical waste by toxicity categories.

Environmental Impact Assessment (EIA) Act (Cap E12 LFN 2004) This was promulgated to assess the impact of any kind of project on the environment and it further makes it mandatory for an EIA report to be issued from the Federal Ministry of Environment. Environmental Impact Assessment is the process of identification of any contrary effect that may arise from siting certain projects in a particular area as well as the mechanisms put in place to contain, curtail, mitigate such contrary effect and as well ensure that parties who are adversely affected get restitution. Thus, the Environmental Impact Assessment should ensure that before an approval

is granted in respect of any project, the appropriate government authorities have fully identified and considered the environmental effects of the proposed activities under their jurisdiction and control and affected citizens had an opportunity to understand the proposed project and expressed their views to the decision makers.

The 1999 Constitution of the Federal Republic of Nigeria (Cap C23 LFN 2004): It is worthy of note that the 1999 Constitution of the Federal Republic of Nigeria recognizes the need to protect the environment. The Constitution recognizes the need for environmental protection as it provides that "the state shall protect and improve the environment and safeguard the water, air and land, forest and wild life of Nigeria." It is obvious from this provision that the government realizes that there is a need to protect the environment so as to make it worth living for the Nigerian people. It is worthy of note that as beautiful as this provision is, it falls within the rights under Chapter II of the Constitution which are non justiciable rights. It is my view that this right should be one of the rights under Chapter IV of the Constitution so as to enable it have the kind of weight it ought to have in the country. As far as this right is concerned, it is just a toothless bull dog. The Constitution as the principal legislation in the country should ensure that this right is justiciable.

The National Environmental Standards and Regulations Enforcement Agency
(NESREA) Act 2007 (Cap 301 LFN 2010): This Act was established in 2007. NESREA replaced FEPA. NESREA was established as a parastatal of the Federal Ministry of Environment, Housing and Urban Development. It is charged with the responsibility for the protection and development of the environment, biodiversity conservation and suitable development in Nigeria's natural resources in general. The vision of the Agency is to ensure that Nigerians have access to a cleaner and healthier environment while the mission is to inspire personal and collective responsibility in building an environmentally conscious society for the achievement of sustainable development in Nigeria.

The Agency's powers are so wide. In the area of protecting the environment, the Agency has the power to prohibit processes and the use of equipments or technology that undermine environmental quality. It also has the power to conduct field follow up compliance with set standards and take procedures prescribed by law against any violator. The Agency also reserves the power to establish mobile courts in order to dispense off cases of environmental violations expeditiously. The Agency can conduct public investigations and make proposals to the minister for the review of existing guidelines, regulations and standards on environment. Also, the Agency can establish programmes for setting standards and regulations for the prevention, reduction and elimination of pollution and other forms of environmental degradation in the nation's air, land, oceans, seas and other water bodies and for restoration and enhancement of nation's environment and natural resources.

This research presents and interprets the data collected through structured questionnaires distributed to respondents across Enugu State, Nigeria, regarding the hazards of telecommunication mast installations and the non-compliance with environmental regulations. The analysis is structured into three thematic areas: health issues, environmental issues, and legal/regulatory challenges. It employs descriptive statistics and mean score interpretation based on a 5-point Likert scale, using the scoring system: SD = 1, D = 2, N = 3, A = 4, SA = 5 while the inferential statistics of the Chi-square were used to test the hypotheses set for the study at 0.05 alpha level.

2. Research Method

This research relies on both doctrinal and non-doctrinal research method. Questionnaires were admitted to residents within Enugu State Nigeria and the findings are found below.

2.1 Demographic Analysis of Respondents

This section analyzes the demographic distribution of the study population. These characteristics are crucial in understanding the background and potential biases or perspectives influencing respondents' answers, especially in a socio-environmental study like telecommunication mast installation hazards.

Table 1: Demographic Breakdown

Variable	Distribution	Frequency	Percentage (%)
Gender	Male	42	42%
	Female	58	58%
Age Range	18–25 yrs	18	18%
	26–35 yrs	44	44%
	46–55 yrs	31	31%
	56+	6	6%
Marital Status	Single	23	23%
	Married	58	58%
	Divorced	6	6%
	Separated	13	13%
Educational Qualification	SSCE	6	6%
	OND/NCE	20	20%
	BSc/HND	15	15%
	MBBS	30	30%
	LLB	18	18%
	Postgraduate	11	11%
Profession	Trading	25	25%

Variable	Distribution	Frequency	Percentage (%)
	Civil Service	37	37%
	Legal Practice	22	22%
	Medical Practice	16	16%

The results in Table 1 indicate that the gender distribution shows a balanced but slightly female-majority respondent base. This is important because studies have shown that women tend to report environmental and health risks more keenly, especially in domestic settings (Wester et al., 2024). Also, empirical data show that women generally score higher on pro-environmental attitudes, reinforcing the idea of heightened environmental sensitivity (Nagy, 2025). The largest group (44%) falls within the 26–35 years category, followed by 46–55 years (31%). This indicates that most respondents are in their working age and potentially homeowners, making them relevant stakeholders in mast placement issues. The youth segment (18–25) is less represented (18%), while those over 56 years are very few (6%), possibly due to lower response rates or reduced digital engagement in older populations. The largest group (44%) falls within the 26–35 years category, followed by 46–55 years (31%). This indicates that most respondents are in their working age and potentially homeowners, making them relevant stakeholders in mast placement issues. It also shows highly educated respondent base, with: MBBS holders (30%) and LLB (18%) indicating strong representation from the medical and legal professions. Only 6% have only SSCE, suggesting that the opinions expressed in the survey are largely informed by advanced knowledge and professional training. This high literacy rate supports the reliability of responses related to regulatory awareness, environmental risks, and legal rights. The civil service sector forms the largest share (37%). This is critical since many of them are likely familiar with government policies and enforcement processes. Traders (25%) add grassroots perspective, while legal (22%) and medical (16%) professionals bring subject-matter insights into legal enforcement and public health implications, respectively. The diversity of age, profession, and education provides a broad view of perceptions across key stakeholders such as civil servants, legal practitioners, and the educated public are vital for a regulatory-focused study.

3. Analysis of Research Questions

3.1 Research Question One: To what extent do occupants of residences close to telecommunication masts perceive that mast installation poses health challenges (such as illnesses, miscarriages, or medical complications)?

Table 2: Health Issue Responses

S/N	STATEMENT	RESPONSES					$\bar{x}$	REMARK
		SD	D	N	A	SA		
6	Masts cause health hazards	02	02	10	66	20	4.00	Agree
7	Experienced health challenge due to nearby masts	10	08	15	39	28	3.66	Agree
8	Underwent medical check-up during mast installation period	20	10	05	21	44	3.59	Agree
9	Still have health challenges due to proximity to mast	12	16	20	42	10	3.73	Agree
10	Know someone who suffered illness/miscarriage near mast	05	06	12	47	30	3.91	Agree
	GRAND MEAN						3.78	Agree

Source: Field Study (2025)

These results indicate high perceived health risks associated with telecommunication masts. The average score across the section (mean ≈ 3.78) reflects broad concern, corroborated by studies such as: Hardell and Nilsson (2023), found that prolonged exposure to electromagnetic radiation from masts may lead to symptoms like headaches, fatigue, and reproductive issues. Likewise, Okoro and Oye (2025) documents the rise in noise pollution, air quality decline, and increasing complaints of health symptoms like headaches, insomnia, and reproductive issues among residents. However, WHO (2014) and Health Security Agency (2024) cautions on the lack of long-term data but recommends precautionary placement away from residential zones. This validates the precautionary principle, urging regulatory agencies to consider health-based zoning standards.

3.2 Research Question Two: How do residents perceive the impact of telecommunication mast installation on the environment (e.g., pollution, property destruction, structural defects)?

Table 3: Environmental Hazards

S/N	STATEMENT	RESPONSES					$\bar{x}$	REMARK
		SD	D	N	A	SA		
11	Masts caused structural defects to nearby buildings	04	02	04	60	30	4.40	Agree
12	Collapsed masts have led to deaths	05	05	10	35	45	4.10	Agree
13	Masts led to environmental pollution (air, water, noise)	10	05	11	46	28	3.77	Agree
14	Masts caused destruction of properties	07	08	15	35	35	3.83	Agree
	GRAND MEAN						4.03	Agree

Source: Field Study, 2025

Respondents express strong agreement that mast installations lead to structural and environmental degradation (overall mean ≈ 4.03). This aligns with documented incidents in Nigeria specifically in Port Harcourt and Lagos where improperly installed

telecommunication towers or masts have collapsed, causing casualties and damage (Yanda et al., 2020). Similarly, in 2022, NESREA shut down several towers in Kaduna due to collapse risks from poor environmental assessments (Guardian Nigeria, 2022). NESREA Guidelines (2009) recommend a 10-meter setback from residential buildings, but enforcement remains inconsistent (Ogboru, 2015). These findings support the argument that environmental risks are not only perceived but demonstrated in real cases.

3.3 Research Question Three: Are residents aware of existing laws and regulations governing telecommunication mast installation in Nigeria?

Table 4.4: Legal Issues

S/N	STATEMENT	RESPONSES					$\bar{x}$	REMARK
		SD	D	N	A	SA		
15	Aware of environmental risks of masts	06	07	15	40	32	3.85	Agree
16	Aware of health risks of residential mast placement	05	10	05	30	50	4.10	Agree
17	Aware that legal frameworks exist for mast regulation	04	02	10	35	49	4.26	Agree
18	Operators comply with regulations	42	35	01	10	12	2.15	Disagree
19	Aware of court cases filed regarding mast hazards	10	15	10	40	25	3.55	Agree
	GRAND MEAN						3.55	Agree

Source: Field Study, 2025

While respondents show high awareness of both the existence of legal frameworks (mean = 4.26) and the risks, there is a low perception of compliance by telecom operators (mean = 2.15). This signals a major enforcement and compliance gap. This is in tandem with the study of Jutum et al., (2021) which provides visual evidence of improper installations and underscores the widespread nature of non-compliance. Though, Ariyoosu (2014) identifies jurisdictional conflicts between agencies like NESREA and NCC as a major factor undermining enforcement. He recommends legal harmonization and clearer penalties for non-compliance to improve environmental protection.

Respondents are moderately aware of such cases (3.55), suggesting some level of legal literacy, but limited public knowledge of successful enforcement outcomes.

3.4 Testing the Research Hypotheses

3.4.1 Research Hypothesis One (H_{01}): There is no significant relationship between respondents' gender and their perception of health challenges associated with telecommunication mast installations.

Table 5: Chi-square analysis of the Research Hypothesis One (H_{01})

S/N	ITEMS	N	$\bar{x}$	DF	X^2	p	DECISION
H_{01}	Health Issues	100	3.78	20	162.35	.000	Reject H_{01}

Source: Field Study (2025).

The Chi-square values (X^2) for the above table is 162.35, degree of freedom (DF) is 20 at 0.00 level of significance. Hence, since $p < .001$, the null hypothesis which states that there is no significant relationship between respondents' gender and their perception of health challenges associated with telecommunication mast installations is hereby rejected and we accept the alternative hypothesis H_1.

This show that women consistently report more nuanced, widespread concerns. Men showed polarized responses, especially in legal/regulatory issues. The gender differences are statistically significant ($p < .001$).

3.4.2 Research Hypothesis Two (H_{02}): There is no significant relationship between respondents' educational qualification and their perception of environmental challenges associated with telecommunication mast installations.

Table 6: Chi-square analysis of the Research Hypothesis One (H_{02})

S/N	ITEMS	N	$\bar{x}$	DF	X^2	p	DECISION
H_{02}	Environmental Issues	100	4.03	20	203.061	.000	Reject H_{02}

Source: Field Study (2025).

The Chi-square values (X^2) for the above table is 203.061, degree of freedom (DF) is 20 at 0.00 level of significance. Hence, since $p < .001$, the null hypothesis which states that there is no significant relationship between respondents' educational qualification and their perception of environmental challenges associated with telecommunication mast installations is hereby rejected and we accept the alternative hypothesis H2.

There is a strong and statistically significant relationship between respondents' educational level and their perception of environmental challenges ($p < .001$).

This implies that more educated respondents (LLB, MBBS, Postgraduates) are more critical and aware of environmental challenges.

3.4.3 Research Hypothesis Three (H_{03}): There is no significant relationship between respondents' profession and their awareness of laws/regulations and enforcement guiding telecommunication mast installations.

Table 4.5: Chi-square analysis of the Research Hypothesis One (H_{03})

S/N	ITEMS	N	$\bar{x}$	DF	X^2	p	DECISION
H_{03}	Legal Issues	100	3.55	20	174.021	.000	Reject H_{03}

Source: Field Study (2025).

The Chi-square values (X^2) for the above table is 174.021, degree of freedom (DF) is 20 at 0.00 level of significance. Hence, since $p < .001$, the null hypothesis which states that there is no significant relationship between respondents' profession and their awareness of laws/regulations and enforcement guiding telecommunication mast installations is hereby rejected and we accept the alternative hypothesis H_{03}.

Profession strongly influences perception of legal/environmental awareness and enforcement: Legal practitioners see enforcement as necessary and possibly achievable. Traders tend to agree but lack full legal context. This confirms that legal exposure influences legal optimism. Legal practitioners and civil servants perceived greater failure of government enforcement, compared to traders. This suggests professional exposure influences awareness and perception of sanctions.

5. Summary, Conclusion and Recommendations

5.1 Summary of Findings

This study investigated the hazards of telecommunication mast installations and the non-compliance with environmental regulations in Ogun State, Nigeria. Using quantitative data from 100 respondents analyzed via SPSS, the study found that:

- There is widespread awareness of health and environmental risks.
- Respondents strongly believe telecom operators often violate regulations.
- Enforcement by regulatory agencies is perceived as ineffective.
- Legal actions are not frequently pursued despite high awareness among certain groups.

5.2 Key Findings

Domain	Key Result
Health	Strong belief in health risks; lived experiences reported by many
Environment	Highest concern in structural damage and pollution
Legal Awareness	Public knows the laws exist
Legal Action	Few believe telecoms comply; moderate awareness of legal enforcement

5.3 Conclusion

Despite an established legal framework, enforcement gaps persist. Education, age, gender, and profession significantly influence respondents' perceptions. Without effective regulation, public health and environmental degradation may worsen.

Implications for Policy and Practice

- Need for Transparent Enforcement: Regulatory bodies like NESREA and NCC must collaborate to ensure effective zoning and environmental impact assessment enforcement.
- Public Legal Empowerment: NGOs and legal practitioners should engage in community awareness and legal support for enforcement.
- Data-Driven Site Approvals: Telecoms must use geospatial and environmental data to avoid densely populated or structurally weak zones.
- Mandatory Health Checks: Policies could include mandatory health impact assessments (HIA) for mast installations.

5.4 Recommendations

- Strengthen Regulatory Enforcement: NESREA and NCC should coordinate better and enforce penalties for violations.
- Public Legal Education: Use civil society and media to educate citizens on legal rights and complaint mechanisms.
- Legal Support Services: NGOs and legal aid providers should offer litigation support to affected communities.
- Community Involvement: Establish feedback channels for host communities during mast installation processes.
- Further Research: Conduct longitudinal and geospatial studies to assess long-term impacts of mast installations.

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Appendix

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Respondent sex	100	1.00	2.00	1.5800	.04960	.49604
Age group	100	1.00	4.00	2.3600	.08589	.85894
Marital status	100	1.00	4.00	2.0900	.09000	.90000
Educational background	100	1.00	6.00	3.6700	.14217	1.42173
Profession	100	1.00	4.00	2.3500	.10860	1.08595
Valid N (listwise)	100					

Chi-Square Tests

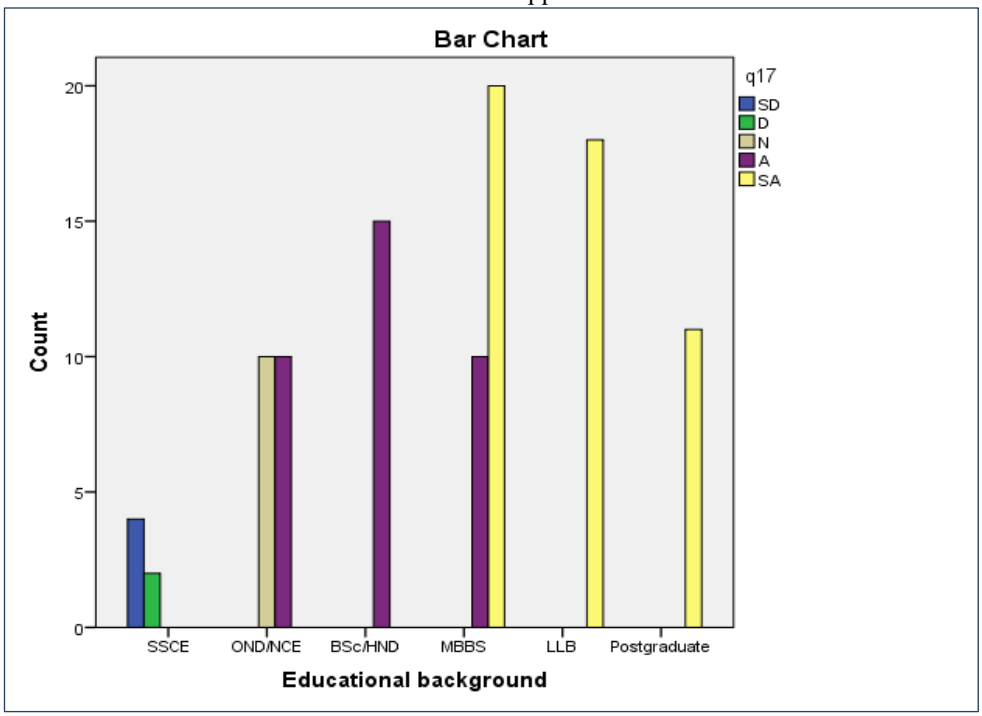
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	203.061[a]	20	.000
Likelihood Ratio	157.292	20	.000
Linear-by-Linear Association	67.650	1	.000
N of Valid Cases	100		

a. 21 cells (70.0%) have expected count less than 5. The minimum expected count is .12.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	1.425			.000
	Cramer's V	.712			.000
Interval by Interval	Pearson's R	.827	.019	14.542	.000[c]
Ordinal by Ordinal	Spearman Correlation	.866	.021	17.124	.000[c]
N of Valid Cases		100			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.



Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	236.749[a]	20	.000
Likelihood Ratio	207.237	20	.000
Linear-by-Linear Association	73.933	1	.000
N of Valid Cases	100		

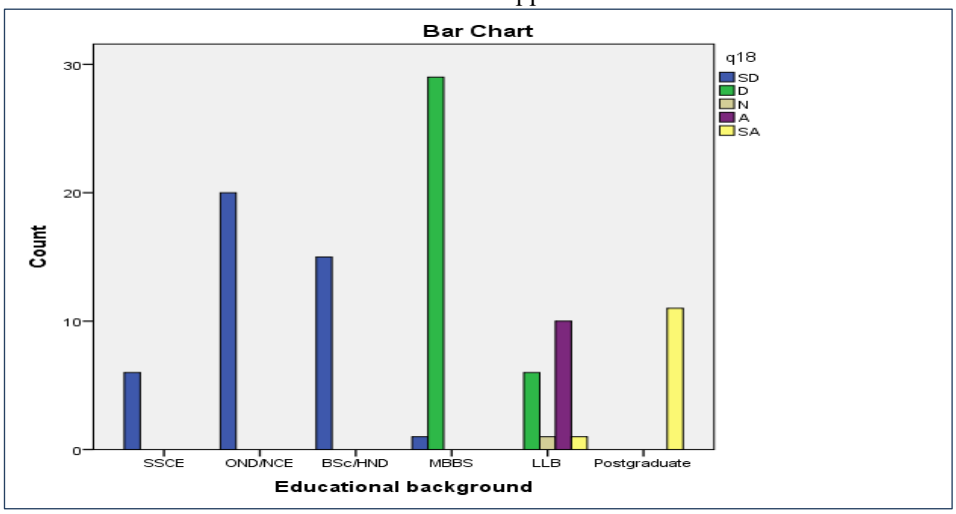
a. 22 cells (73.3%) have expected count less than 5. The minimum expected count is .06.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	1.539			.000
	Cramer's V	.769			.000
Interval by Interval	Pearson's R	.864	.020	17.001	.000[c]
Ordinal by Ordinal	Spearman Correlation	.941	.012	27.448	.000[c]
N of Valid Cases		100			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.



Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	174.021[a]	12	.000
Likelihood Ratio	185.102	12	.000
Linear-by-Linear Association	20.267	1	.000
N of Valid Cases	100		

a. 12 cells (60.0%) have expected count less than 5. The minimum expected count is 1.60.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	1.319			.000
	Cramer's V	.762			.000
Interval by Interval	Pearson's R	.452	.060	5.023	.000[c]
Ordinal by Ordinal	Spearman Correlation	.502	.097	5.747	.000[c]
N of Valid Cases		100			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Based on normal approximation.