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THE COMMUNICATIVENESS OF ROAD TRAFFIC SIGNS IN UYO, AKWA IBOM STATE OF NIGERIA

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Abstract

This study set out to investigate “The Communicativeness of Road Traffic Signs in Uyo, Akwa Ibom State of Nigeria.” The population of the study comprised road users in Uyo – motorists (private and commercial), tricycle riders and pedestrians – a total of 250, although 235 actually participated in the study. Part of the study involved presenting the respondents with road traffic signs and asking them to interpret the signs. The findings indicated that road traffic signs in Uyo are communicative to road users. In spite of this, the compliance level of road users with the demands of road traffic is low, and educational background does not seem to correlate with the understanding of and compliance with road traffic signs. It is recommended that the relevant government agencies and even voluntary organisations should carry out more enlightenment campaigns on the meanings of road signs and the importance of obeying them. Studies should be carried out to ascertain why road users intentionally flout road traffic signs.

Introduction

Man lives a communication-dependent life; hence communication is central to the functioning of the society. It is the most important human trait and surviving skill. It involves the reception and interpretation of stimuli affected by a mutually intelligible concept called language. It is not limited to the process of sharing information, but includes “a sign-mediated interaction governed by man’s understanding in interpreting the meaning. Communication is a kind of meaning-dependent interaction, where the interacting agents share a common set of signs and semiotic rules” (Iyorza, 2008, p.27). Meaning and understanding are therefore central to information, be it spoken, written, signs or signal in a given linguistic and cultural community.

Communication could be verbal or non-verbal, written or unwritten. In the category of non-verbal communication are gestures, signs and other meaningful body expressions. A relevant aspect of non-verbal communication is sign(s) language which includes sight (visual communication), touch (tactile communication), smell (olfactory communication), taste (gustatory communication), gestures (body communication) and signs. Sign language is vital to the safety and survival of man on the road, air or water.

Every safety-minded society in meeting emerging challenges has evolved certain codes to serve as a road map in certain environments and situations. Hence, Nigeria has designed a Road Traffic Code as a guide for road users, motorists and pedestrians. The Code includes road signs, road markings, computerised traffic lights, traffic control signals, among others, with communicative symbols where necessary or applicable. Accordingly, the language of a road traffic

code is signs-dependent, and is designed in a manner that could be easily understood by all categories of road users. These signs, with or without inscriptions, could be symbolic, iconic, indexical or any combination of these, and are placed on or by the road for safety purposes, with the expectation that road users' understanding could affect a corresponding compliance which, to a larger extent, would reduce the rate of road accidents.

There are many possible precautionary safety measures that can be taken to reduce road accidents, one of which is the provision of safety signs. Safety signs are intended to identify and warn road users against specific hazards without the use of words. They may also describe safety precautions, advise users on the actions to take, or provide other directions that can eliminate or reduce hazards. Safety signs provide good communication to users, as failure to effectively convey warning information can lead to injury or death. This is because if safety signs are not readily identifiable, then their communicative value is suspect.

Accident on the road is one of the most prominent causes of injury, incapacitation and death in the world. For quite a long time, Africans, and indeed Nigerians, have been deluded to believe that road accident is an integral element of human fate. It is also believed to be the outcome of spiritual manipulation by wicked forces. This belief tends to inspire considerable indifference to the prevalence of road accident, since injury or death resulting from traffic crash is accepted as part of human destiny.

There is no doubt that technological innovations have been brought to bear in vehicles and the roads on which the vehicles ply. Of equal importance is the fact that urbanization and population expansion also affect the manner of driving on the highways, the result being that ill informed drivers cannot help but get themselves and other motorists into avoidable road traffic crashes with fatal consequences.

It is assumed that traffic signs which are clear, simple and understandable could be effective in inducing road accidents. This being so, is it possible that effective traffic signs can reduce the incidents of road carnage in Uyo, the capital city of Akwa Ibom State in South-South Nigeria? Therefore, this study attempts to assess the communicativeness of road markings, computerised traffic lights, road signs, traffic control signals/symbols among others and the extent to which they are understood, applied and complied with by road users in Uyo Urban.

1.2 Statement of the Problem

In the city of Uyo, as in other cities of the world, there are road signs, markings, and signals, amongst others, which are meant to guide road users and ensure their safety. Most of the road signs alert motorists on significant road conditions such as a sharp bend ahead, failed or narrow bridge etc. Also, road markings show lane divisions and lane discipline, stop lines and pedestrian crossing. Computerized traffic lights indicate when and when not to move, while traffic control signals are displayed by traffic officers to ensure free-flow of vehicular and human traffic. The essence is to reduce the rate of road traffic crashes. In spite of these, unfortunately, accidents continue to occur, and somehow tend to be on the increase. Could it be that many road users are ignorant of the meanings of the signs, or do road users intentionally violate the traffic rules? Could the situation be blamed on the illegibility of these signs? Or are the signs not communicative enough? These questions necessitated the study. In other words, what is the extent of the communicativeness of road traffic signs in Uyo urban?

Research Questions

This study was guided by the following research questions:

- i. To what extent are road traffic signs communicative to road users in Uyo Urban?
- ii. To what extent do road users adhere to traffic signs?

- iii. Does educational background have any effect on road users' understanding of traffic signs?
- iv. How effective are road traffic signs in Uyo Urban?
- v. What other variables on their own or in relation to road traffic signs can communicate safety or danger on the road?

Area of Study

The study area of this work is Uyo, the capital city of Akwa Ibom State, in the South-eastern tip of Nigeria. Its metropolis sprawls into the adjoining local government areas of Itu, Ibiono Ibom and Uruan Local Government Areas. It has an area of 168km² with a population of 554, 906 people (National Population Commission, 2006). Uyo is bounded on the East by Abak Local Government Area; on the North by Abak, Ikono, Ibiono Ibom and Itu Local Government Areas, on the East by Uruan; Ibesikpo Asutan and Nsit Ibom Local Government Areas and on the South by Etinan and Mkpato Enin Local Government Areas. The population density is 1400/km².

Uyo became a state capital on 23rd September, 1987, the day Akwa Ibom State was created out of the erstwhile Cross River State, as the 21st State of Nigeria. The State lies wholly within the tropics along the South South corner of Nigeria and the Gulf of Guinea, and situates on Latitudes 4^o32'1" and 5^o33'1" North and Longitudes 7^o25'1" and 8^o25'1" East. The state is bordered on the East by Cross River State, on the West by Rivers and Abia States, and on the North by Abia and Cross River States and on the South by Atlantic Ocean and the Southermost tip of Cross River State.

Significance of the Study

The importance of this study lies in the fact that the findings will be an input to government, particularly the Police and the Federal Road Safety Commission, in evolving policies aimed at reducing or possibly eliminating accidents on Nigerian roads. It is assumed that Uyo being a typical Nigerian city with the attitudes of residents largely the same as those of residents of other Nigerian cities, the findings can be safely generalised for the rest of Nigeria.

Limitations of the Study

A major limitation of this work was the hesitation by some of the respondents, especially the taxi and bus drivers, to complete the questionnaire. In addition, the poor understanding of major road signs captured in the questionnaire also posed problems to the respondents, as a result of which the researchers took time to explain the signs to the respondents. At the end, though, only a few did not return their copies of the questionnaire. However, since the number was few, it could not affect the subsequent generalisation of the findings of the study.

Operational Definition of Terms

For the purpose of this work, the following concepts are contextually defined:

- i) **Communicativeness:** This refers to the understanding of information conveyed by traffic signs by road users in Uyo, Akwa Ibom State of Nigeria.
- ii) **Road:** This is the hard surface built for and used by vehicles and people in Uyo, Akwa Ibom State of Nigeria.
- iii) **Traffic:** In this study, traffic is the movement of people and vehicles on roads in Uyo, Akwa Ibom State.
- iv) **Road Traffic Signs:** In this work, road traffic signs refer to drawings, markings, acts or gestures displayed in public and inscribed with words or designs intended to convey an idea, command, information or warning to road users in Uyo, Akwa Ibom State.

- v) **Traffic Lights:** These are signalling devices (sets of coloured lights) positioned at road intersections, pedestrian crossings and other locations in Uyo: typically red for stop, green for go and yellow for proceed with caution (standby).
- vi) **Code:** This is a system of words, letters, numbers or symbols that represents a message for road users in Uyo.

Theoretical Framework

This work is anchored on two theories: the gestalt theory of visual perception and the perceptual theory of visual communication – in particular, semiotics. The *gestalt theory of visual perception* is based on the observations of German psychologist Max Wertheimer. As explained by Lester (2011, p.45): “The eye merely takes in all the visual stimuli, whereas the brain arranges the sensations into a coherent image”. Wertheimer’s idea led to the famous statement: “The whole is different from the sum of its parts”. That is to say, perception is a combination of sensations and not of individual sensory elements.

According to the gestalt theory, the brain combines discrete elements within a scene through a series of four principles that are often called laws: similarity, proximity, continuation and common fate. Objects that are similar are automatically grouped together by the brain, which also associates objects close to each other than it does two other objects that are farther apart. The brain also seeks as much as possible a smooth continuation of a perceived movement. Similarly, the brain groups together things that appear to have a common destiny (Lester, 2011).

Semiotics (or semiology) is the study or science of signs. According to Lester (2011, pp. 52-53), “a sign is simply anything that stands for something else...anything word or physical presentation, from a yelled comment to an arranged jacket, is a sign if it has meaning beyond the object itself. Consequently, the meaning behind any sign must be learned. In other words, for something to be a communicated sign, the viewer must understand its meaning”.

Modern semiotics are anchored on the writings of Swiss linguist Ferdinand de Saussure who developed a general theory of signs, and American philosopher Charles Sanders Peirce who published a work on the effects of signs on society. Peirce went further to formulate three different types of signs: iconic, indexical and symbolic.

Iconic signs resemble closely the thing they are meant to represent, for example, street signs that indicate dangerous and road conditions. “Indexical signs”, according to Lester (2011, p.55), “have a logical, commonsense connection to the thing or idea they represent rather than a direct resemblance to the object. Consequently, their representation takes a little longer than that of icons”. For example, the footprints represent the person who impressed them; the sun’s shadow implies the movement of time.

On the other hand, symbolic signs are abstract: the symbols have no logical or representational connection between them and the things they represent. Therefore, symbols have to be taught as they are greatly influenced by social and cultural considerations with their meanings being passed from generation to generation. Hence, meanings of symbols are highly personalized and distinct, and therefore evoke strong personal reactions from the audience. For example, the burning of a country’s national flag is a protest gesture and act of defiance.

Origin and Meaning of Signs

Signs are basic elements of human thought and communication. When a sign is seen, it makes one to reflect on something beyond the visual image of the sign. Sign is used in communication to represent a transmission, construct, or phenomenon which possesses an ‘acoustic

image'. It is also a concept through which one organisation or individual affects the behaviour or state of another (Wilson, 2006).

Semiotics is a branch of communication which is concerned with the study of signs, codes and culture. Sometimes, however, signs can be confused with signal and symbol. Wilson (2006, p. 8), citing the anthropologist, Ashley Montagu, defines sign as “a ‘concrete denoter’ possessing an inherent specific meaning, roughly analogous to the sentence”. However, there are some defining properties which identify signs, namely: it must have a physical form; its use must refer to something, i.e. have a referent other than itself; and it must be recognised by people as a sign. Every sign is for a purpose and is meaningful within a context in society.

Yule (2006) in *The Study of Language* sees sign as a system of hand signals developed by speakers for limited communication in a specific context where speech cannot be used. In some religious orders where there are rules of silence, restricted alternate sign languages are used, for instance, by monks in a monastery. In some cases, speech is avoided completely and quite elaborate alternate sign languages are used.

As a natural language functioning in the visual mode, the Nigeria Highway Code (NHC) is designed for the eyes and not the ears. It tells one about traffic regulations, special hazards and other road conditions, construction areas, speed limits etc. For instance, there are hand signs one should recognize while on the road. The figures below indicate traffic hand signs and signals.

Hand Control Signals



Source: FRSC's Nigeria Highway Code, 2008

A trained car driver should understand the international driving codes which are represented on the highways by road signs. These signs usually mean the same thing in all countries, including Nigeria and precisely Uyo, the capital city of Akwa Ibom State, except for a few local variants which, nonetheless, have universal application within national boundaries. Whatever type it is, a sign is meaning-dependent and communicates within a given culture. Inscription in signs (legend) is a property of modernisation and mainly for complementary and clarity purposes. Every sign, of course, forms a fundamental unit, as McGregor (2009) opines, and it is used in the representation and conveyance of information. It involves the pairing up of a form (roughly, something perceivable) with a meaning (a mental notion or idea).

In his own view on signs, Wilson (2006) says:

Sign language is a common feature of all cultures and has developed out of a sign. It is a mode of human communication developed principally for deaf and dumb as well. Human beings sometimes communicate with pet animals through the use of language. Some signs are natural while others are man-made. Some previous culture-specific signs have become universal because of the extension of cultural influence through the mass media, religion, warfare, international trade and travel.

Signs are objects produced in order to signify. Others are objects produced in order to perform a given function. The latter are recognised as forms that elicit or permit a given function, precisely because their shape suggests that possible function. Such signs are functionally and meaningfully decoded.

Road Traffic Signs

Pixton (2008) asserts that road traffic signs originated in Rome in the Middle Ages when milestones were used to indicate distances in the Roman Empire. He further states that road traffic signs were discovered to be relevant at the advent of automobiles. This prompted the Italian Touring Clubs to design the road sign system in 1895. The basic patterns of road traffic signs were set at the 1908 International Congress in Rome. The intensive work on international road traffic signs took place between 1926 and 1949 when Europe developed its road traffic sign system from where the United States took off in the 1950s. Nigeria adopted the road sign system in the 1970s.

Chan and Annie (2006) posit that road traffic signs must be visible, illuminating, relevant, comprehensible and standardized. Nigeria's Federal Road Safety Commission, FRSC, in the 2008 revised edition of the *Highway Code*, notes that road traffic signs in Nigeria bear same characteristics with those of the developed countries. On categorisation, FRSC groups the signs as follows: traffic signs, signals, road signs and pavement markings. This study, however, uses road signs, road markings, computerised traffic lights and traffic control signals, derived from the road traffic code.

Road signs provide information on speed limits and road conditions. They inform motorists on what to do, what to watch out for and where to drive. Simpson (2009, p.121) lays emphasis on the legibility and visibility of road signs in the day and night. The letterings or signs must be adequately sized, with a brief legend for quick comprehension by road users approaching the sign. Simpson emphasises that road signs are made of "specific shapes and colours in order to be easily recognised. They are simple and uniform in design, correctly positioned on the right side of the road with (or without) inscribed legend simple enough to be understood". These, according to him,

facilitate road users' quick understanding. He recommends that road signs should be separately installed except where one sign supplements the meaning of the other, but not to incite a conflict.

Road signs could be regulatory, prohibitory, mandatory or informative. White, yellow, blue, red and black colours are used for road signs and the letterings, while the shapes vary depending on the messages they convey as indicated below:

Their shape are:

Regulatory Signs are mostly circular in shape and are of two types. Those with red & yellow circles are **PROHIBITIVE SIGNS**.

Those with blue circles but no red border are **MANDATORY SIGNS**. They give positive instructions, and are regulatory signs

Informative Signs
They are usually rectangular in shape and provide guidance **information**

The Stop Sign is a prohibitive sign. It is the only 8 - sided traffic sign. It means come to a complete stop before entering. Proceed when it is safe to do so.

Warning Signs are usually triangular in shape, with red perimeter.

The only one warning sign with inverted triangle mean **YIELD** or **GIVE Way**

REGULATORY SIGNS

REGULATORY SIGNS (Prohibitory)

WARNING SIGNS



REGULATORY SIGNS (Mandatory)



REGULATORY SIGNS (Mandatory)



Source: FRSC's Nigeria Highway Code, 2008

A no-u-turn sign is normally positioned a few metres to a controlled intersection where u-turn is not allowed. Conventionally, u-turn is not allowed at the crest or brow of a hill, bends, corners, busy streets or highways where vehicles cannot be seen 120 metres away and where a no-u-

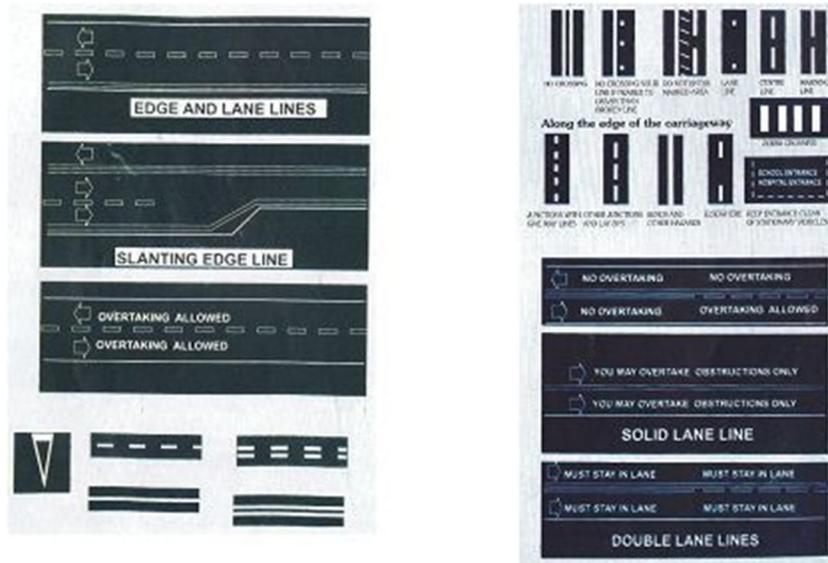
turn sign is pasted. This is because making a u-turn at such road conditions is consequential and dangerous.

The next road traffic signs considered are the road markings. Pixton's (2008) views align with the position of FRSC on the nature and function of road markings. They are lines and symbols that show roads alignment. They indicate the number of lanes on the road, where it is permissible to overtake, and where to stop for pedestrians etc. Road markings include centre lines, edge lines, lane lines, crosswalks, zebra crossing or pedestrians crossing and pavement messages, and are reflective in order to be visible at night. Centre lines separate traffic proceedings on opposite directions; broken lines are used to indicate that there are no overtaking restrictions. Where there are such restrictions, a solid line is painted alongside the broken lines, indicating that the driver may not overtake if the solid line is on his right side of the centre line.

Edge lines are solid lines; where they slant towards the centre of the road, they forewarn that the road is narrowed ahead. An edge line could be crossed only by the traffic moving to and from the shoulders of the road. Zebra crossing is indicated by white solid lines across the road to denote pedestrian cross walks commonly found at intersections. Drivers must stop for pedestrians at zebra crossing.

Pavement markings are lettered or painted on the road to warn road users on road conditions ahead and separate opposing streams of traffic that direct vehicles into proper positions on the roadway. They delineate turn lanes at intersections and establish no-passing zone. White and yellow paints are customarily used for all road markings with reflective devices for visibility at night. Lane lines do not allow for overtaking except where there is obstruction. Vehicles must drive in between the lanes (Uwen, 2011). This is pictorially captured below:

ROAD MARKINGS



Source: FRSC's Nigeria Highway Code, 2008

Another interesting category of road traffic signs is the computerised traffic light. They are usually positioned at roads intersection with heavy traffic. They direct streams of vehicles and pedestrians on when to go, stop, get ready, or proceed with caution. Yayi (2008, p.111) emphasises that "computerised traffic lights when effectively configured can work independently with timers and can connect and control traffic on several intersections...(the) control computer continuously

scans the traffic information from each detector, selecting the best timing for each signal to reduce traffic congestion and minimize delays”. The lights are of three colours: green, amber and red. Green means ‘all vehicles can move’; amber implies ‘be read to go’, and red indicates that ‘all vehicles should stop’.

There is also the GREEN MAN, a green (colour) image of a man walking. Where the GREEN MAN appears in the traffic light box, pedestrians may cross if the road is clear. If the GREEN MAN flashes or blinks, then the traffic light colour is about to change. At this point, pedestrians are not supposed to cross except where they have started already, then they have time to finish crossing. It is mainly a signal for pedestrians. The reverse is the case when the traffic light turns on or flashes the RED MAN. The figures below show traffic light.



Traffic Control
Officer

Source: FRSC's Nigeria Highway Code, 2008

The final category of road traffic signs in this discourse is the traffic control signal. At traffic-prone junctions, traffic officers such as men of the Nigeria Police Force, Federal Road Safety Commission, and other traffic regulatory agencies, are positioned to direct the free flow of vehicular and human traffic. Saaz (2007) calls these signals ‘traffic pantomime’. He sees this art of body movement as pantomimic and a major aspect of non-verbal communication.

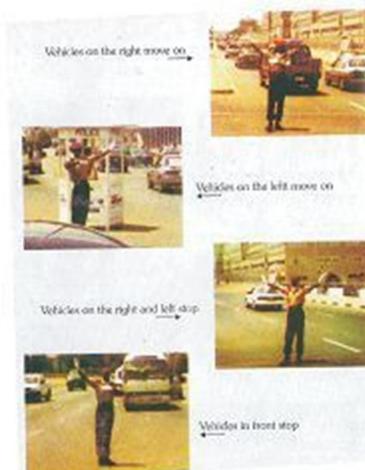
Finegan (2008), reviewing Saaz’s position, argues that there are three basic modes of linguistic communication: speaking, writing and signing – the use of visible gestures to communicate. Corroborating Finegan’s view, McGregor (2009) affirms that sign language uses manual signs, facial and bodily gestures, combining them under a system of grammatical rules to create an infinite number of meaningful sentences. Similarly, Wilson (2006, p. 8) asserts that “in many societies, various signs are used to communicate specific meanings or messages”. Thus, traffic officers control and direct human and vehicular movement through non-verbal communication and other symbolic dispositions. This is accomplished by meaningful body movements and/or hand signals, and directly influences the traffic behaviour of ‘informed’ motorists and pedestrians at these points. They use reflective devices for safety and visibility.

Signalling is an ancient form of non-verbal communication. Although most signals may be distinct and domesticated within a given ethno-cultural society, such as the Greek choreography, most other ones such as shrugging of the shoulder, nodding of the head, crossing of the legs etc are, unarguably, cross-cultural, and, therefore, mutually intelligible among communicators of different socio-cultural groups.

Naturally, such common signals as beckoning on someone to come (stretching the hand repeatedly but incompletely folding the fingers), signalling someone that you do not understand, frowning and waving of the hand are obtainable in virtually all cultures. These enable someone who does not understand a language to resolve common but vital communicative challenges.

These and many other signals collectively form the sign language of a particular ethno-cultural group. Meaningful gestures from varying ethno-cultural groups could be developed to form an acceptable sign language. Traffic control signals emerged from the standardization of such conventional signals which today form a dependable mode of communication on the road. Traffic officers are expected to display relevant and timely signals simple enough and conventionally meaningful in order to be easily understood by approaching road users. Below are signals by a road safety officer signalling vehicles at various points to stop and/or to move at different sides on the road:

TRAFFIC CONTROL SIGNALS



Source: FRSC's Nigeria Highway Code, 2008

Characteristically, road traffic signs could be symbols, icons or indexes but are generally coded and designed to direct, regulate and control traffic on the highway. Ochigbo (2006) views symbols as an expressible representation of something, which in itself lies beyond the sphere of expression and communication, a hidden and inexpressible reality.

A symbol is the conventionally or arbitrariness of the relationship between the sign and its signification. A symbol has no qualitative or physical link to its object. Akpan (1987) posits that when we employ a sign deliberately in order to convey a message, we are using a symbol. He, however, reiterates that a symbol requires an interpreter who knows something about the system by virtue of which the symbol has meaning. It is arbitrary in that any symbol agreed on will carry the meaning assigned to it. It serves the purposes of communication only after it has been validated by

conventions. It can be interpreted by knowing their socially determined meaning which came into being out of societal needs.

Symbols express the thesis and antithesis of the ideas they represent. As artistic marks, they are aesthetically alluring and as surrogates, they are revealing. The arbitrariness of symbols indicates that there is no casual or inherent connection between symbolic signs and what they signify or indicate.

Similarly, McGregor (2009, p. 87) holds that “the form and meaning of symbolic signs are purely related by conventions being established and acquired through repeated instances of communication”. The form therefore bears no apparent similarity to the meaning, and is not naturally associated with it. Symbols and the object they bring to mind are related in arbitrary manner. They could be in the form of marks, pictures, paintings etc, and are conventional signs. Road traffic signs such as SCHOOL CHILDREN CROSSING, SLOW DOWN, MEN AT WORK, DANGER AHEAD have the pictures of ‘school children walking’ and ‘a man pushing a wheel barrow’ respectively. The letterings as legends interpret the pictures (symbols), and as such they complement the functions without conflicting with the intended information to be conveyed to motorists and other road users. Symbols are ethno-cultural concepts, although some symbols and their meanings do cut across ethno-cultural boundaries. Where they are ethno-culturally bound, their relevance and meanings are within the confines of the community. The understanding of symbolic road traffic signs depends on literacy level and familiarity with the (Uwen, 2011).

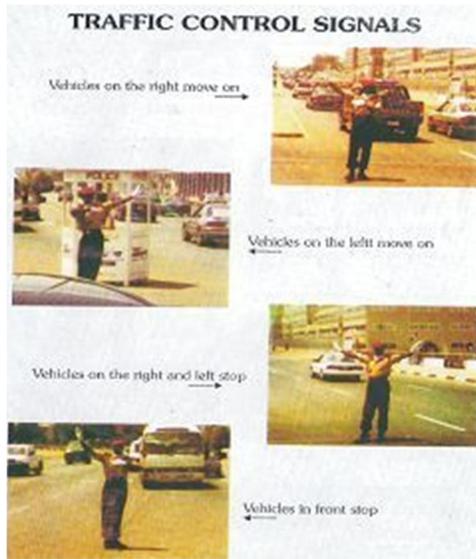
McGregor (2009) opines that an iconic sign has a form resembling its meaning in some way. The form usually shows some characteristics of the corresponding concepts. This description is likened to the road sign for a snake-like road bend. The next figure indicates a dangerous double bend showing how exactly the road condition is. This warns the motorist ahead that there is a double bend ahead, first to the left. Motorists are cautioned by the information to drive slowly and avoid overtaking. It is iconic because it shows how exactly the road is and also bears its true semblance.



DANGEROUS DOUBLE BEND
(FIRST TO LEFT)
Sign of Dangerous Double Bend

Source: FRSC's Nigeria Highway Code, 2008

Most road traffic signs have similar characteristics with an index. An index, according to Finegan (2008), has a logical and physical connection to the object. It brings a concept to mind by means of a direct physical connection between itself and its object. It denotes its object by being physically linked to it, or affected by it. Indexical signs call upon the hearer (observer) to use his power of observation, and so establish a real connection between his mind and the object. A signal of this nature often points to a situation and calls for immediate but causally related action. The pictures below are traffic control signals: an indexical sign. It shows a road safety officer signalling to motorists.



Source: FRSC's Nigeria Highway Code, 2008

Such a logical connection implies an indirect relationship with the object, and by extension its meaning. Gestures are non-linguistic signals and virtually all meaningful gestures are indexical signs. Where the communicators are not of same cultural group (in this case, the road user and the traffic control officer), then observation becomes an instant learning technique. The 'alien' road user could keenly observe how other road users are responding to displayed signals in order to respond same.

The underlying relevance of signs, including road traffic signs, is to communicate effectively. Accordingly to Hawkers (1977, p. 125), "human beings communicate by non-verbal means and in ways which must consequently be said to be non-linguistic but embedded in the concept of language, that every message is made up of signs, and some signs have triadic relations of performance involving actual entities in the real world". The author identifies the icon, index and symbol of having these triadic relations. This implies that there could be symbolic icons, or iconic symbols etc, and the nature of a sign's ultimate dominant mode will depend finally on its context. He further states:

A road traffic sign may be said to combine index (pointing to a situation and calling for immediate, causally related action) and icon, a corresponding situation, (red, in our society, signals 'danger', 'stop'; green signals the opposite) and these arbitrarily related colours (symbols) are binarily opposed by the traffic signalling system.

In line with the above stance, there appear to be instances where a single road traffic sign could be simultaneously indexical, symbolic and iconic. A green traffic light, for instance, indicates that vehicles can move. The meaning could be observable (indexical). The green colour, conventionally, is a 'peaceful' sign (symbolic) and there is a logical resemblance between the green light and the free flow of traffic which it denotes (iconic).

Additionally, road traffic signs may be characterized as complex in nature; however, they are generally useful. They transmit information, and effect communication through visual and meaningful images directed towards a particular goal. Relating the communication channel with a road sign, the source becomes the relevant road traffic regulations. The encoder is the institution

installing the sign; the signal is the road sign; the decoder is the road user, while the destination is the action or reaction of the road user which may save or endanger motorists or other road users.

Cognitive Process of Road Traffic Signs

The action and reaction of road users when a traffic sign is sighted follows a mentally oriented comprehension process. In-coming stimuli (information conveyed by road traffic signs) are first processed by the sensory system such as the machinery of the eye via a visual recognition, and then interpretation. Wilson and Itek (2006, p.39) see cognition as “a set of processes which make it possible for behaviour to be adapted to conditions which used to prevail or to conditions which are about to prevail”.

This has to be facilitated by presumptions, intended inference and shared contextual knowledge and beliefs to explicate the connection between signs and their communicative intents. This process of visual recognition of signs, understanding, interpretation and subsequent reaction by the road user is what Akmajian, Demers and Harnish (2004, p. 425) call ‘comprehension process’. They posit that ‘the study of the processes of comprehension, from signal to understanding, does not suffer the problems of identification and manipulation’.

The problem this lies in understanding, which produces the output. Understanding is a paramount concern because its degree determines the predictive output. Where understanding is below average or none at all, the output, of course, would be a wrong reaction and could result in road traffic crash. Cognition is the output of the entire process which is fundamentally and functionally relevant.

In discussing the functional analysis of cognition in the context of road traffic signs, every road user is assumed to have a prior knowledge of recognizing the sign as information aided by visual competence. The interpretation capacity identifies the meaning of the road traffic sign and interprets it along with the complementary inscription or legend (where applicable). It puts the meaning of the word(s) and/or the sign in context. The realistic interpretation capacity enables road users to show the expected response on approaching such a road traffic sign. This behaviour in its actual sense must be in conformity with the communicative intent of such a sign (Uwen, 2011).

All communicative processes complement one another within a limited time to bring the corresponding response(s) from the road user. Given the fact that road users are mobile, the process of cognition, comprehension and response should not be a time-consuming activity. This goes to re-emphasize the relevance of background knowledge as the road may not be the ideal place for learning; rather it offers an opportunity to practise.

Categories of Road Users

The Federal Road Safety Commission, Nigeria identifies eight categories of road users in Nigeria. These are the motorist, the pedestrian, the cyclist, the motorcyclist, the child, the animal, the hawker and the trader. The motorist refers to the class of road user enclosed in motor vehicles. The pedestrian is a person who is walking on the road, especially in an area also used by motorists. Drivers share the road with many other road users among whom are pedestrians who are part of the exposed road users.

A cyclist is a person that rides a bicycle, motorcycle or tricycle or other such vehicles. A motorcyclist is a person that rides a two wheel vehicle, tricycle or moped powered by an engine. Drivers and cyclists are urged to be careful near schools, churches, mosques, markets, snacks shops, ice cream stalls, parks, fruits trees, or street hawkers, because children are usually found in such places.

Review of Studies

A study on “Traffic Signs: State of the Art and Possibilities for Development” was carried out by Dewar (1995) in the University of Calgary. The study summarized that:

- (i) Drivers on today’s busy, complex, high-speed roads often fail to read and understand traffic sign information in time to act on the information safely. In order for a traffic sign message to communicate effectively, it must be easily detected, attract attention, be legible when seen only briefly and from the appropriate distance, and must be easily and quickly understood.
- (ii) Many signs fail to meet these criteria. Shape and colour codes are widely used on traffic signs to convey information beyond the specific sign message (e.g. red and white triangular warning signs in Europe; rectangular green guide signs in North America), but many drivers do not understand the codes.
- (iii) The use of pictographs is also prevalent throughout the world. They have advantages over word signs – they are more legible at a distance under poor visibility conditions, they are understood more quickly and by drivers who do not read the local language.

In another study, Tolmie, Foot and McLaren (1996) focussed on “Child Development and the Aims of Road Safety Education: A Review and Analysis”. The aim was to ascertain if changes in knowledge or attitude led to changes in actual traffic behaviour. The analysis was summarized under the following sub-headings:

- (i) **Detecting the Presence of Traffic:** The detection of traffic involves a range of processes including selective attention, visual search, resistance to distractibility, co-ordination of visual and auditory information and the perception of crossing locations as safe or dangerous (in terms of opportunities they afford for detecting approaching traffic).
- (ii) **Visual Timing Judgments:** This requires the pedestrian to determine the vehicle’s direction and rate of movements so that accurate time of contact judgments can be made. Such judgments provide information about the time available for crossing.
- (iii) **Co-ordinating Information from different Directions:** The pedestrian rarely has to deal with traffic approaching from a single direction; thus, timing and other judgments must be made in relation to vehicles approaching from two or more directions. This requires the ability to divide attention, to hold information in memory and to co-ordinate and integrate this information.
- (iv) **Co-ordinating Perception and Action:** This involves the ability to relate the time available for crossing to the time required to cross. The latter will vary according to the characteristics of individual’s own movement as well as the factors such as the width of the road. Such knowledge about movement capability must then be calibrated to visual information about the time available for crossing so that realistic safety margins can be set and other decisions made.

Research Methodology

This study used the survey method, which probes opinions, attitudes, feelings and dispositions of samples toward a given phenomenon, and uses the outcome to generalise on the entire population. This method was adopted because it was believed to be appropriate in ascertaining the opinions, feelings, behaviours and attitudes of road users in Uyo towards traffic signs.

The population of the study was all adult road users in Uyo. Adulthood is here defined as those who have attained the age of 18. That age is the minimum driving age in Nigeria. Eighteen is

also the age of consent in Nigeria. According to the 2006 Census conducted by the National Population Commission, the population of residents in Uyo is 305,961. The number also doubled as the population of the study because the National Population Commission does not have data on residents of Uyo who are 18 and above.

For the purpose of generating data from the respondents, the researchers made use of the questionnaire and personal observation as instruments for data gathering. The questionnaire was divided into three sections. Section A had four questions on personal information about the respondents; section B contained eight questions on respondents' understanding of road traffic signs, while section C had 15 traffic inscriptions (signs) pictorially displayed for respondents to comment on their communicativeness.

Sample/Sampling Procedure

Meyer's (1979) formula for drawing a sample was used in determining the sample size for the study. For a population of 305,961, a sample of 250 was selected, and the sample cut across all categories of road users included in this study. Accordingly, there were 135 pedestrians, 30 commercial motorists, 20 tricycle riders and 65 private motorists. The respondents were purposely selected. The respondents (motorists, tricycle riders and pedestrians) were accessed at major motor parks and loading bays. At these points, the respondents were relaxed and inapprehensive.

The Findings

The questionnaire was administered on 250 respondents. However, 235 completed and returned the questionnaire (131 pedestrians, 25 commercial motorists, 16 tricycle riders and 63 private motorists). One hundred and sixty five respondents (70%) were male, while 70 respondents (30%) were female. Sixty per cent of the respondents were aged between 18 and 30, 29% were between 31 and 40 years, 7% fell within 41 – 50 years of age while 4% were 51 years and above in age. In terms of educational qualification, 45% of the respondents possessed a minimum of a bachelor degree; 15% had a National Diploma or its equivalent; 34% had the secondary school certificate; 5% possessed the First School Leaving Certificate while 1% had no formal education.

On understanding road traffic signs, 78% said they understood the signs, 65% said they did not while 16% were uncertain of their understanding. On the legibility of the signs, 63.5% stated that the traffic signs were clear enough, 22% were unsure of their legibility while 15% were categorical that the signs were not legible.

Were the traffic signs communicative enough to guide users to avoid accident on the road? Forty-nine per cent answered in the affirmative, 31% in the negative and 20% were unsure. Following from the above, 61% said the traffic signs were not confusing, 18% said they were while for 21% the signs were sometimes confusing. In spite of most respondents acknowledging that the traffic signs were not confusing, 42% said they disobeyed road traffic signs, 28% said they obeyed the signs while 30% would sometimes disobey or obeyed the signs.

On whether traffic codes should be written in local languages, 88 (37%) respondents answered in the affirmative; 121 (52%) said no, whereas 26 (11%) said traffic codes could sometimes be written in local languages. Were there are other variables that could communicate safety/danger on the road? To this, 178 (76%) of respondents said that other variables could communicate safety/danger on the road; 41 (17) said there were no other variables, while 16 (7%) were unsure.

Table 1: Testing of Respondents' Knowledge of Road Signs based on their Educational Qualification

1.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
2.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
3.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
4.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
5.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
6.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
7.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
8.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
9.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
10.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
11.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
12.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
13.	SLOW DOWN	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
14.	DIVERSION	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....
15.		Yes <input type="checkbox"/>	No <input type="checkbox"/>	Comment.....

Table 2: Respondents (2) who had no formal education

Sign No	RIGHT		WRONG	
	No. of Respondents	Percentage	No. of Respondents	Percentage
1	2	100	0	0
2	2	100	0	0
4	2	100	0	0
5	2	100	0	0
6	2	100	0	0
7	1	50	1	50
8	1	50	1	50
9	1	50	1	50
10	0	0	2	100
11	0	0	2	100
12	0	0	2	100
13	1	50	1	50
14	2	100	0	0
15	2	100	0	0
16	0	0	2	100

The table above indicates that two of the respondents who had no formal education were able to identify the meaning and communicativeness of some of the traffic signs captured pictorially in the questionnaire.

Table 3: Respondents (13) who had First School Leaving Certificate (FSLC)

Sign No	RIGHT		WRONG	
	No. of Respondents	Percentage	No. of Respondents	Percentage
1	12	92	1	8
2	12	92	1	8
3	10	77	3	23
4	9	69	4	31
5	7	54	6	46
6	1	8	12	92
7	3	23	9	77
8	5	38	8	62
9	1	8	12	92
10	1	8	12	92
11	1	8	12	92
12	4	31	9	69
14	12	92	1	8
15	8	62	4	31

In Table 3, a handful of respondents who had educational qualification up to FSLC level, were able to identify few of the signs, meaning that the less literate persons in the study area could understand and interpret road traffic signs if given adequate orientation.

Table 4: Respondents (79) who had Senior Secondary Certificate (SSC)

Sign No	RIGHT		WRONG	
	No. of Respondents	Percentage	No. of Respondents	Percentage
1	66	84	13	16
2	66	84	13	16
3	69	87	10	13
4	69	87	10	13
5	24	30	55	70
6	6	8	73	92
7	25	32	54	68
8	36	46	43	54
9	3	4	76	96
10	20	25	59	75
11	16	20	63	80
12	24	30	55	70
13	61	77	18	23
14	45	57	34	43
15	6	8	73	92

Table 4 above indicates that out of 79 respondents who had SSCE, only very few were able to identify and understand the traffic signs captured pictorially in the questionnaire.

Table 5: Respondents (36) who had National Diploma (ND) /Nigerian Certification in Education (NCE)

Sign No	RIGHT		WRONG	
	No. of Respondents	Percentage	No. of Respondents	Percentage
1	31	86	5	14
2	30	83	6	17
3	28	78	8	22
4	29	81	7	19
5	13	36	23	64
6	3	8	33	92
7	9	25	27	75
8	8	22	28	78
9	5	14	31	86
10	10	28	26	72
11	5	14	31	86
12	13	36	23	64
13	25	69	11	31
14	26	72	10	28
15	2	6	34	94

Table 5 shows that although respondents under this category had educational qualification up to ND/NCE level, not many of them were able to give the correct meaning and interpretation of

the road signs. This implies that educational level does not always have a positive effect on the interpretation of road traffic signs by road users.

Table 6: Respondents (105) who had First Degree and Above

Sign No	RIGHT		WRONG	
	No. of Respondents	Percentage	No. of Respondents	Percentage
1	31	86	5	14
2	30	83	6	17
3	28	78	8	22
4	29	81	7	19
5	13	36	23	64
6	3	8	33	92
7	9	25	27	75
8	8	22	28	78
9	5	14	31	86
10	10	28	26	72
11	5	14	31	86
12	13	36	23	64
13	25	69	11	31
14	26	72	10	28
15	2	6	34	94

In Table 6, it is seen that irrespective of their educational qualification, some respondents did not understand that meaning and interpretation of a handful of the traffic signs in the questionnaire. This suggests that although educational level has a role to play in the interpretation of road signs, it does not always have a positive effect.

Discussion of Findings

Research Question 1: To what extent are road traffic signs communicative to road users in Uyo Urban?

The majority of the respondents indicate that they understand the meanings of the road signs. This implies that the road signs are communicative to the extent that the road users can interpret them. This can be attributed to many factors including the fact that many of the road users are familiar with the traffic signs, and, overtime, they are able to interpret them. Secondly, it is believed that the signs are clear enough for the road users to comprehend within their short contact with the signs.

As stated earlier, every road user is assumed to have a prior knowledge of recognizing the sign as information aided by visual competence. Uwen (2011) has stated that the realistic interpretation capacity enables road users to show the expected response on approaching such a road traffic sign. The background knowledge of the users on the road traffic signs eases comprehension and makes it less time-consuming.

Research Question 2: To what extent do road users adhere to traffic signs?

It is one thing to understand road signs, it is something else to exhibit a behaviour demanded by the signs. However, comprehension precedes behaviour and not vice versa. Social change is

actually driven by knowledge which then affects attitude and practice. In reality, the number that accepts a practice is always lower than the number that is knowledgeable about the behaviour.

It is not surprising therefore that while 78% of the respondents indicated they understood the road signs, only 49% of the respondents could say with some certainty that they adhere to road traffic signs. Thus, it could be said that many road users in Uyo cannot claim ignorance or lack of understanding of the road signs, but that their attitude and practice is on the low side and is not commensurate with their cognition level.

Against the backdrop that the road signs, according to the respondents, are not confusing, then the failure to adhere to road traffic signs is more an attitudinal problem common in developing societies and less lack of communicativeness of the traffic signs. This is because only a handful of respondents (20%) say the traffic signs are sometimes confusing, and so flout the traffic signs. As minor as the percentage is, this category of road users that complains that the traffic signs are confusing and therefore do not adhere to them, can actually pose some potent threat to safety on the road. It is doubtful if these disobedient road users understand that they are a clear and present danger on the road.

Is the “confusion” in understanding road signs a product of lack of clarity of symbols/ signs or the language being used? The respondents’ answer to this question tilts to the latter. That explains why some indicate that the road traffic code should be written in local languages. The point is, to the extent that is possible, the traffic code should be localised. But the limitation of many of the local languages in Nigeria offers no strong hope in this area. Besides, the symbols and signs are universal, and so have universal application.

Research Question 3: Does education background have any effect on road users’ understanding of the traffic signs?

The data indicate that those with higher educational background do not necessarily understand road signs more than the less educated. In some instances, the less educated interpreted the signs as much as those with higher educational qualifications. Sometimes, the former had it better than the latter. This means that higher education status does not translate into identifying, interpreting and obeying road signs. To interpret road signs may also demand a conscious effort, just as complying with the demands or meanings of those signs. A wealthy and highly educated user of the road who is arrogant may likely consider it demeaning to obey road signs. This implies that obeying road signs is a matter of positive attitude towards the law in general and safety on the road in particular. It further implies that both the highly and the less educated, if given proper orientation on the interpretation of road traffic signs, would be able to comprehend such signs at any point in time.

Research Question 4: How effective are the road traffic signs in Uyo?

The effectiveness of road traffic signs borders on the clarity of signs. The majority of the respondents attest to the clarity of the road traffic signs. Although clarity is not synonymous with understanding, it does enhance understanding. Signs that are not clear are likely to repel road users who would not spend their time trying to make meaning out of something that seems to communicate nothing to them. Clarity brings about attention; attention provokes thoughtfulness; thoughtfulness engenders comprehension; comprehension could lead to compliance with what is demanded. Therefore, the beginning of the process of compliance with the demands of a traffic sign is the clarity of the sign. In this lies its communicativeness. Yet communicativeness is not effectiveness. Effectiveness is a reflection of road users’ obedience to traffic signs. In this study, the findings indicate that the level of compliance is low and to that extent the road traffic signs are not

very effective. With more persuasion and orientation, the respondents' attitude towards the signs may change for the positive which may lead to practice or action.

Research Question 5: What other variables on their own or in relation to road traffic signs can communicate safety or danger on the road?

Respondents affirm that there are other variables which can communicate safety or danger on the road. Such variables include placing of plants on the road, hand-waving/signals by motorists, hanging of leaves on the vehicle etc. This indicates that road users, particularly motorists, do not depend solely on road signs planted by the authorities, but devise their signs which are mutually intelligible and acceptable in a particular society. Although these variables do not and cannot replace the conventional road traffic signs, they do complement the traffic signs to communicate safety or danger on the road.

It need be said that on some roads (which are far from the city) where the traffic signs are unavailable, these non-standardized signs can help in communicating danger or safety. The aim of road traffic signs is to ensure safety on the road; hence any sign, other than the globally accepted ones, that enhance safety on the road is, surely, a welcome complement.

Summary of Findings

The findings of the study are summarised as follows:

- i) Road traffic signs in Uyo are communicative to road users in Uyo, the Akwa Ibom State capital.
- ii) Most road users in Uyo Urban do not adhere to traffic signs, even when they understand the signs.
- iii) Educational background does not always have a positive effect on the interpretation and understanding of road traffic signs. A higher educational status does not translate into a better understanding of the road traffic.
- iv) Road traffic signs in Uyo are not very effective because in spite of their understanding of the signs, road users do not always adhere to the signs.
- v) Other variables which do communicate safety or danger on the road include hanging of leaves on a vehicle, hand-waving/signals by motorists, and temporary placing of plants on the road.

Conclusion

From the findings of the study, it is hereby concluded that although road signs in Uyo Urban are highly communicative, the level of compliance with the demands of the signs is low. It is also concluded that educational qualification is not a major factor in understanding and interpreting road traffic signs.

Recommendations

Based on the findings above, it is recommended that:

1. The relevant agencies, in particular the Nigeria Police and the Federal Road Safety Commission, should intensify enlightenment campaigns on the meaning of road signs and the importance of compliance by road users.
2. They should also be out on the road to physically enforce compliance with the road signs.
3. The agencies should commission a study to ascertain why road users flout road traffic signs. The findings will serve as input into better road traffic management.

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