

Opción

Revista de Antropología, Ciencias de la Comunicación y de la Información, Filosofía,
Lingüística y Semiótica, Problemas del Desarrollo, la Ciencia y la Tecnología

Año 35, mayo 2019 N°

89

Revista de Ciencias Humanas y Sociales
ISSN: 1012-1017 ISSN-e: 2577-0225
Depósito Legal pp. 192402211457



Universidad del Zulia
Facultad Experimental de Ciencias
Departamento de Ciencias Humanas
Maracaibo - Venezuela

Subjective perception of time as a temporal fictional image

Ella V. Nesterik^{1,*}

¹Buketov Karaganda State University, Karaganda, Kazakhstan
ella.nesterik@bk.ru

Gaukhar I. Issina²

²Buketov Karaganda State University, Karaganda, Kazakhstan
g.issina@mail.ru

Fazira A. Kakzhanova³

³Buketov Karaganda State University, Karaganda, Kazakhstan
Fazira11@mail.ru

Darina Y. Amanbekova⁴

⁴Buketov Karaganda State University, Karaganda, Kazakhstan
vergalievna@mail.ru

Abstract

The article is concerned with subjective perception of time, also known as psychological time, in the capacity of a textual category and a fictional image via comparative qualitative research methods. As the basis for this hypothesis in its turn we refer to the results of similar investigations in literary studies, psychology and text linguistics. As a result, words describing real fictional time and space quite often appear in descriptions of psychological time. In conclusion, the category of fictional time plays a very important role in the modeling of the subjective perception of time by characters.

Keywords: Fictional, time, textual, category, image.

La percepción subjetiva del tiempo como imagen temporal ficticia

Resumen

El artículo se ocupa de la percepción subjetiva del tiempo, también conocida como tiempo psicológico, en la capacidad de una categoría textual y una imagen ficticia a través de métodos comparativos de investigación cualitativa. Como base de esta hipótesis, a su vez, nos referimos a los resultados de investigaciones similares en estudios literarios, psicología y lingüística del texto. Como resultado, las palabras que describen el tiempo y el espacio ficticios reales aparecen a menudo en las descripciones del tiempo psicológico. En conclusión, la categoría de tiempo ficticio juega un papel muy importante en el modelado de la percepción subjetiva del tiempo por parte de los personajes.

Palabras clave: ficticio, tiempo, textual, categoría, imagen.

1. INTRODUCTION

The present study is dedicated to the investigation of temporal images that occur in fictional texts and convey subjective perception of time by fictional characters (Bejan, 2019). In text linguistics which is the prime area of our study, this variety of time is construed as a specific reflection of real temporal interrelations in an individuum's consciousness. Subjective perception of time is often referred to as perceptual Turaeva (2014) and psychological time. Owing to the fact

that psychological time has peculiar features, the reflection of temporal relations in our consciousness is not completely identical with the real time.

In contrast to the time of the objective world the time of the psychic world does not always flow at the same speed, can be interrupted, and chronologically inconsequent. It is accounted for by the fact that our sense of time and estimation of time intervals duration depend on a number of phenomena, directly and indirectly, involved in the process of perception. Chief among these are senses or sensory modalities (visual, auditory, etc.) (Wassenhove et al., 2008), emotions (happiness, sadness, fear, and other) (Dawson and Sleek, 2018), actions and real events (Desantis et al., 2016), space as it is connected with time in our brain, and they both can influence each quite strongly (Burr and Morrone, 2006).

When it comes to fictional time, researchers distinguish two ways of its presentation in fictional works: objective fictional time including cyclic time and subjective fictional time including psychological time (Galperin, 2016). Unlike with the objective fictional time that reflects universally valid properties of time – onedimensionality, unidirectionality and continuity – subjective fictional time conveys individual peculiarities of time perception including those mentioned above. It can be further divided into fictional characters' biographic time, the time of their activity and their perception of time which is the focus of our research. The object of our research is subjective perception of time as a textual category and a fictional image. The main objective of our research is to determine the

role played by the linguistic means expressing the category of fictional time in modeling subjective perception of time in a fictional text. To attain the posed objective, we have accomplished the following tasks: using the results of fictional time investigations in the study of literature, psychology and text linguistics we have defined more precisely the formal and semantic aspect (the plane of content and plane of expression) of psychological time and carried out a detailed analysis of the contexts in which linguistic means expressing the category of fictional time partake in the formation of subjective perception of time.

Subjective perception of time as a part of subjective fictional time serves to convey the characters' inner world and determine readers' emotional perception. It should be noted that characters' time perception is not restricted to the deformation of the flow of time in their minds caused by certain situations or states. It can be understood in a broader sense – as their perception of a time-epoch in which case it serves to express ideological aesthetic evaluation (Nesterik et al., 2014). Subjective perception of time as a text category has a formal and semantic aspect. The plane of the content of psychological time includes the notions conveyed by this category. The plane of expression is represented by a number of linguistic means expressing these notions in a text. The content plane of psychological time is polysemantic. Subjective perception of time shows the manner of time and action flow in a fictional text and conveys subjective evaluation of the situation described (Nesterik et al., 2016).

The expression plane of subjective perception of time is no less complex than its plane of content. It comprises a large number of different language phenomena. As previously stated, the reflection of temporal relations in an individual's consciousness is not completely identical with real temporal relations which is due to the fact that subjective perception of time involves and is affected by physiological, sensory and emotional processes, events of the real life, subjective space and cyclic time. Being basic components of time perception, the listed phenomena determine its representation in a fictional text. Hence, we can maintain that subjective perception of time is modeled by means of different text categories – the category of fictional time, namely, cyclic and physiological time included in this category, the category of events and processes, the category of subjective evaluative modality and the category of subjective space.

Providing clearer, the expression plane of subjective perception of time can be presented by words belonging to the semantic field of cyclic time, words of the category of events, lexemes with the meaning of sensory and emotional evaluation and language means modeling space relations in a fictional text (Nesterik et al., 2017). In this research, we focus on fictional time and discuss the extracts in which subjective perception of time is revealed indirectly through textual temporality. The analysis involves extracts from the works of English and American writers of XIX-XX centuries – Roald Dahl, John Saul, Mark Twain, Arthur Charles Clarke, David Lawrence, Edna Mayne Hull, John Grisham, Colin Wilson, William Faulkner, Alfred van Vogt, Gilbert Chesterton, Edgar Poe – and is based on the following

linguistic methods: the method of contextual, component and stylistic analysis and the method of classification.

2. LITERATURE REVIEW

In this paper psychological time is considered from different perspectives – psychological, literary and linguistic. As noted by Eagleman: —the recent renaissance of temporal illusions is ripe to trigger a cross-disciplinary approach (Eagleman, 2008: 15). Most of the psychological investigations involved in the current research were mentioned in Introduction for which reason we suggest only one but quite comprehensive and interdisciplinary research of this kind – Subjective Time. As the name implies it provides among other things a profound background of the problem under consideration. As to the literary studies connected with the issue, most of them are mainly concerned with the typology of fictional time and its functions as a fundamental element in fiction. They are related to epochs in literature, different types and genres of fictional works and approach the object either as a theme or as a philosophical concept (Bourne and Bourne, 2016).

Some of them focus on the connection of time and space in fictional texts of different genres, comparing this connection in different spheres – linguistics (Vukanovic and Grmusa, 2009; Moore, 2014). None of them, however, attends to the plane of expression of fictional time, i.e. the set of language means modeling it in texts of

fiction, their analysis and classification. Subjective fictional time is no exception to this state of things. It is commonly studied in theory and with reference to certain literary epochs, such as Modernism, genres and/or authors (Ambrose Bierce Khanom (2013), Edgar Allan Poe Wang (2013)) and as specific techniques that novelists use to distort the passage of neurobiological time so as to convey their characters' state of mind and emotions.

3. RESULTS

The analysis of the means expressing the category of reference showed that words describing real fictional time and space quite often appear in descriptions of psychological time. One of the most common ways of conveying subjective fictional time are the words that denote time intervals of different lengths. We are talking about such indicators of time as a minute, hour, day, year, etc. The lexical meanings of these words contain no indication to the nature of the passage of time. However, with their help, the authors introduce an assessment of the time duration by the character, create the illusion of the passage of time in the episode. Let us consider a few examples.

1. And there it was! Mr. Boggis saw it at once, and he stopped dead in his tracks and gave a little shrill gasp of shock. Then he stood there for five, ten, fifteen seconds at least, staring like an idiot, unable to believe, not daring to believe what he saw before him (Dahl, Parson's Pleasure)

2. Was he still out there? She did not know. The seconds dragged on, turning into minutes (Saul, the Blackstone Chronicles).

3. But as the minutes of prayer ticked by and slowly turned into hours, the face that Martha Ward beheld began to change (Saul, the Blackstone Chronicles).

The above passages depict frozen and decelerated time. In example 1 this uncertainty is created by the expression at least indicating a longer period of time than that expressed by the adverbial modifier of duration for five, ten, fifteen seconds. The purpose of such division is to create the illusion of time movement like the movement of a second hand fixing equal time intervals with the marks on the dial. Fixing individual periods of time slows down its progress: the objective course of real-time is continuous. In the second example, we see a different situation. Time in the mind of the heroine is slow. Its movement is conveyed by the verb drag. However, this movement becomes tangible thanks to the words seconds and minutes. The noun seconds means here not external but internal time, i.e. time in the perception of the subject: the article refers to the time period seconds to the message about the thoughts of the character.

In addition, it indicates metonymically the mental state of the subject while maintaining its quantitative and temporal meaning. Anxious seconds slowly flow into anxious minutes. The noun minutes extends the time interval denoted by the lexeme seconds and at the same time reports a change in the nature of its flow. Second and minute differ not only in quantity but also in quality: a second is faster

than a minute. The same technique is used in Example 3. But here it gives a completely different effect. Against the background of the external time running in a circle this point seems to be completely still: minutes, hours pass, but the heroine does not notice them, she is still immersed in her prayer. In the case when temporal words are directly involved in the formation of psychological time their functional load increases significantly.

1. Ten minutes dragged by. The waiter again! Again he hid behind the paper. The waiter paused — apparently a week — then passed on.
2. The sense of loss was so desolating that I longed to return to sleep. It was well that I failed to do so, for at that moment sleep would have been death. But I did not know this for another five seconds, and during that eternity I was back on Earth, seeking what comfort I could from the past (Clarke, *Dog Star*).
3. Later, I do not know how much later, it may have been a minute, or an eternity, I was awakened by feeling something lifting me... (Lawrence, *a Dream of Life*).

In the first example, temporal words act as indicators of objective and subjective duration. In the latter case they are accompanied by words of dubious evaluation – apparently, seemed to be, seemingly. Indicators of objective and subjective duration form two gradation series.

Examples 2 and 3 describe the frozen time. In both cases, the effect of the vanished time is caused mainly due to the use of the noun

eternity. Eternity can be called an indicator of time only with great reserve. Although the dictionary definitions of this word contain the noun time (infinite or unending time; a very long time), in most cases it is associated with timelessness, i.e. a state in which the sense of time completely disappears. In example 2 this association is supported by words that refer to mental and physiological states – the sense of loss, sleep, death. The third example contains means that indicate the speaker's inability to give an adequate estimate of the time interval. These are the verb to know in the negative form, the subjunctive form may have been and the conjunction or. There are also simpler ways of presenting psychological time in a fictional text.

1. It seemed to Celeste as if hours had passed since she had heard her mother's muffled scream, cut off almost the instant it had begun (Saul, the Blackstone Chronicles).
2. For a long second, Kennijahn's mind held hard on the idea of the thought pattern that could have produced such a monstrosity (Mayne Hull, the Wishes We Make).
3. Long minutes ticked away the night while she wondered if she could ever be whole again (Saul, the Blackstone Chronicles).
4. Kennijahn was only dimly aware of the tall, thin figure being escorted out. Nine days, nine short days! His mind twisted off into uncontrollable fury (Mayne Hull, the Wishes We Make).

Time indicators hours, second, minutes, days denote here seeming time, i.e. time as it is perceived by the character. This is a

contextual meaning. It occurs due to the connection with other elements of the text – words of dubious evaluation seem, as if, adjectives long and short (the astronomical minute is always 60 seconds, and the day is 24 hours, only light and dark time of the day can be short and long) as well as with the noun mind and the verb wonder indicating that what is meant here is the time of consciousness. In the following extracts, the subjective-quantitative assessment of the time interval is accompanied by a subjective-qualitative assessment projecting the physiological and mental states of the characters on time.

1. After a long agonizing minute, the beating grew monotonous. Enough, said the ruler in the middle. (Grisham, a Time to Kill).
2. A long and exhausting hour now went past, and I felt like someone lost on a mountain, shouting for help. (Wilson, the Mind Parasites).
3. There was a blinding, choking, terrible pain. A long moment of that sustained, racking agony, and then came to the most awful realization that had ever pierced his brain: He was hanging by his neck. (Mayne Hull, the Wishes We Make).
4. But he could hear, and during those subsequent long seconds while there was absolutely no sound in the crowded little room save that of quiet and intent breathing it was as if he had swung outward at the end of a grape vine, over a ravine, and at the top of the swing had been caught in a prolonged instant of

mesmerized gravity, weightless in time. (Faulkner, *Barn Burning*).

The adjectives long and prolonged introduce a subjective-quantitative assessment of time periods. They indicate that the time denoted by the nouns minute, hour, moment, seconds, instant is extended in the perception of the characters. Such an indication is quite enough to understand what caused the deformation of the perception of time. The adjectives agonizing, exhausting and the phrase racking agony create the image of a painfully long passage of time. The adjective mesmerized denotes metaphorically the state of stupor and indirectly indicates the immobility of time in the perception of the character. As we can see, the subjective-qualitative assessment of the time interval expressed by words with the meaning of emotion contains a quantitative assessment as well, so the latter in most cases turns out to be superfluous.

1. In that first, heart-freezing moment it seemed that something was trying to get into my suit – something invisible, seeking shelter from the cruel and pitiless vacuum of space. (Clarke, *who is there?*)

2. The woman sat very still, almost frozen by the words. Somehow, while she had always felt that she would, in a crisis, produce the letter she had forged, now that the terrible moment was here she felt herself trembling. (Vogt, *the Ghost*).

3. He dug for some dreadful minutes in silence, and then said in a choked voice: I am afraid of his not being the right shape. (Chesterton, *the Honour of Israel Cow*).

4. I shall ever bear about me a memory of the many solemn hours I thus spent alone with the master of the House of Usher. (Poe, the fall of the House of Usher).
5. Tom's days were days of splendor and exultation for him, but his nights were seasons of horror. His dreams were infested by Indian Joe, and always with doom in his eyes. Half the time Tom was afraid that Indian Joe would never be captured; the other half he was afraid he would be. Daily Tom was made happy by Muff Potter's gratitude, but nightly he was sorry that he had not sealed up his tongue (Twain, Tom Sawyer).
6. The farm, she thought with a greedy intensity that shook her heavy body; safety at long, long last. And only a senile old man and a girl standing between her and possession. Between her and the hard, sordid years that stretched behind her. (Vogt, the Ghost).

In most of the passages, temporal indicators are defined by words that express negative emotions, fear and horror. Indeed, these emotions, as a rule, are associated with slowing down or complete cessation of movement – fear makes blood turn to ice, horror makes one go numb. In the first two examples, the feeling of fear is conveyed by the adjectives heart-freezing and terrible. In Example 3 the synonymous adjective dreadful indicates decelerated time since it defines the duration indicator minutes. In the fourth example, the distortion of time perception is signaled by the adjective solemn.

In the last sentence of the passage decelerated tense is expressed explicitly by the adjective *slow* and the verb *drift*. The noun *apprehension* expressing a negative emotional assessment only reinforces the sense of a distorted perception of time. The sixth extract describes the clash of two-time planes – the past and the possible future of the heroine reflecting the conflict between the desired and the actual. The heroine's past is the exact opposite of what she aspires to. It is all hardship and suffering – the death of her husband, the absence of own dwelling, unemployment, lack of money, in a word, a hell. Moreover, each of the listed reasons is highlighted separately although this is not required by the rules of punctuation: a widow and in a tenement house are not homogeneous members of the sentence whereas the homogeneous members two children and an occasional job are connected by the coordinative conjunction *and*. However, the role of cyclic words in the modeling of psychological time is not only that.

1. Cecilia felt all her pent-up rage going down that rain-pipe. At the same time, she almost laughed. It was awful (Indriastuti, 2019).

She lay and listened and listened. No sound! As if time had ceased, she lay inert in the weakening sun. The sky was yellowing. Quickly she dressed, went down, and out to the corner of the stables (Lawrence, *the Lovely Lady*).

2. It was as if he had spoken a keyword. The sunburst brilliantly from behind a mass of dark clouds and flooded the valley with warm light. The blaze of it illuminated the drab old

buildings, and wrought changes. The over-all grayness of the house showed in that bright illumination as a faded green (Vogt, the Ghost).

3. For a long trembling moment, it was enough that the gown itself was a sheeny, lovely creation that she could own at the snap of her finger, and then, as the sun burst from a bed of clouds above, its brilliance emphasizing the shadows inside the window, and starkly reflecting the slight, crooked image of her body, she shuddered (Soo et al., 2019) (Mayne Hull, the Ultimate Wish).

4. She stood very still in front of the bank finally, briefly paralyzed by a thought dark as night (Vogt, the Ghost).

5. There was a memory, too, of washing dishes, but after that a strange, dark gap, a living, evil night flooding her mind ... gone ... hope ... Bill ... damned old man ... (Vogt, the Ghost).

This passage presents two types of fictional time – subjective and objective. The first is motionless, it is depicted by describing the physical states of the character. The second is a continuous stream of time expressed by the words denoting natural phenomena – weakening sun, the sky was yellowing. The fading sun and the yellowing sky signal the coming of the night. The time of the outer world continues its course but the character does not feel it. Thus, cyclical words perform a dual function here: they create the illusion of time flow and thereby emphasize the stillness of time in the consciousness of the character. In Examples 2 and 3 cyclic words perform several functions at once. A mass of dark clouds and a bed of clouds indicate not only

bad weather but also poor visibility, i.e. signal blurred perception. The words denoting sunlight and its movement signal the beginning of the transformation of objects of perception – the sun burst, flooded with warm light, illuminated.

The lexemes indicating the degree of intensity of sunlight, its brightness, emphasize the illusiveness of the perceived by the character and in Example 3 completely destroy the original illusion – the over-all grayness – the blaze, bright illumination – a faded green; a sheeny, lovely creation – the sun, its brilliance – the slight, crooked image. Thus, with the help of cyclical words, the authors create a contrast between the apparent and the real. In the third example in this contrast, the conflict between the desired and the actual is easily guessed. In addition, the listed means resume the movement of fictional time suspended by the description of objects of perception. In the last two examples, cyclic words are used metaphorically. In example 4 the metaphorical comparison dark as night characterizes the object of consciousness thought. Therefore, it is directly related to the perception of the character. When we speak of thoughts as dark or light, we do not mean their color characteristics (Sears, 2018).

4. CONCLUSIONS

The category of fictional time plays a very important role in the modeling of the subjective perception of time by characters. Temporal

words describe the time of the outer and inner world. Linguistic means depicting the objective course of real-time emphasize the immobility or the slow passage of time in the minds of characters. The movement of time of the outer world is conveyed by the words with the meaning of a time interval (indicators of duration). Duration presented as time divided into equal time intervals resembles the movement of a second hand fixing the passage of time with marks on the dial. The noun minutes and hours denoting time metonymically create the impression of a cycle of time. Time running in a circle is depicted with the words indicating the movement of celestial bodies and the change of day and night cycles. The course of objective time is conveyed by the words denoting sunlight and its movements and the words indicating the degree of luminous intensity.

They resume the movement of fictional time interrupted by the description of objects of perception and create a contrast between the imaginary and the real (Kosari, 2018). Inner time is conveyed by indicators of duration and point time and by words denoting cyclical phenomena. Temporal words denoting subjective lengths of time are combined with local verbs, the adjectives long and short, words with the meaning of emotions and words of dubious evaluation. The adjectives long and short introduce subjective quantitative assessment of time periods. The lexemes with the meaning of emotions express a subjective-qualitative assessment of time (an assessment that projects physiological and mental states of characters on time). Words of the dubious evaluation indicate the seeming time, i.e. time as it is perceived by the character. In addition, these means, with the

exception of words of dubious evaluation, indicate the nature of the flow of time in the mind of the subject. The same function is performed by cyclic words used metaphorically. They describe the states of consciousness in which a person loses the sense of reality and thus indirectly indicate the vanished time.

REFERENCES

- BEJAN, A. 2019. **It is spring already? Physics explains why time flies as we age.** Eureka Alert!
https://www.eurekaalert.org/pub_releases/2019-03/duisa032019.php. USA.
- BOURNE, C., & BOURNE, E. 2016. **Time in fiction.** NY: Oxford University Press. pp. 288. USA.
- BURR, D., & MORRONE, C. 2006. **Time perception: space-time in the brain.** Current Biology. Vol. 16, N° 5: 171-173. USA.
- DAWSON, J., & SLEEK, S. 2018. **The Fluidity of Time: Scientists Uncover How Emotions Alter Time Perception.** APS Observer. Vol. 31, N° 8. USA.
- DESANTIS, A., WASZAK, F., MOUTSOPOULOU, K., & HAGGARD, P. 2016. **How action structures time: about the perceived temporal order of action and predicted outcomes.** Cognition. Vol. 146. Pp. 100-109. Netherlands.
- EAGLEMAN, D. 2008. **Human time perception and its illusions.** Current opinion in neurobiology. Vol. 18, N° 2: 131-136. Netherlands.
- GALPERIN, I. 2016. **Text as an object of linguistic research.** M.: URSS: Lenand. pp. 137. Russia.
- INDRIASTUTI, H. 2019. **Entrepreneurial inattentiveness, relational capabilities and value co-creation to enhance marketing performance.** Giap journals. Vol 7. N° 3. India.

- KHANOM, A. 2013. **Silence as Literary Device in Ambrose Bierce's the Occurrence at Owl Creek Bridge**. Teaching American Literature. Vol. 6, N° 1: 45-52. USA.
- KOSARI, M. 2018. **The composition of the board of directors and the structure of capital in banks in the Tehran Stock Exchange**. UCT Journal of Management and Accounting Studies. Vol 6. N° 4. Iran.
- MOORE, K. 2014. **The Spatial Language of Time: Metaphor, metonymy, and frames of reference**. John Benjamins Publishing Company. pp. 340. Netherlands.
- NESTERIK, E., ISSINA, G., PECHERSKIKH, T., & BELIKOVA, O. 2016. **Visual Images of Subjective Perception of Time in a Literary Text**. International Journal of Environmental and Science Education. Vol. 11, N° 9: 2829-2839. Russia.
- NESTERIK, E., KAKZHANOVA, F., ISSINA, G., SHELESTOVA, T., TSAY, Y., KUSMANOVA, G., & PECHERSKIKH, T. 2017. **Spatial Images of Subjective Perception of Time in a Literary Text**. Rupkatha Journal on Interdisciplinary Studies in Humanities. Vol. 9, N° 3: 64-77. India.
- NESTERIK, E., SHELESTOVA, T., EHM, T., & TEMIRBULATOVA, A. 2014. **Sound images of subjective perception of time in a literary text**. World Applied Sciences Journal. Vol. 31, N° 5: 968-974. Pakistan.
- SEARS, R. 2018. **The Implications of a Pacing Guide on the Development of Students Ability to Prove in Geometry**. International Electronic Journal of Mathematics Education. Vol 13. N° 3. pp. 171-183. UK.
- SOO, M., SHELBY, R., & JOHNSON, K. 2019. **Optimizing the patient experience during breast biopsy**. Journal of Breast Imaging. wbz001, <https://doi.org/10.1093/jbi/wbz001>. UK.
- TURAEVA, B. 2014. **A Theory of literary time**. Young Scientist USA. <http://www.youngscientistusa.com/archive/1/91/>. USA.
- VUKANOVIC, M., & GRMUSA, L. 2009. **Space and time in language and literature**. Cambridge Scholars Publishing. pp. 158. USA.
- WANG, E. 2014. **Edgar Allan Poe and Modernism**. English

Language and Literature Studies. Vol. 4, N° 3: 82-89. USA.

WASSENHOVE, V., BUONOMANO, D., SHIMOJO, S., & SHAMS, L.
2008. **Distortions of subjective time perception within and
across senses.** PloS one. Vol. 3, N° 1: 14-37. USA.

Buketov University



**UNIVERSIDAD
DEL ZULIA**

opción

Revista de Ciencias Humanas y Sociales

Año 35, N° 89, (2019)

Esta revista fue editada en formato digital por el personal de la Oficina de Publicaciones Científicas de la Facultad Experimental de Ciencias, Universidad del Zulia.

Maracaibo - Venezuela

www.luz.edu.ve www.serbi.luz.edu.ve

produccioncientifica.luz.edu.ve