Original Paper

Textuality in Online News Paper Articles

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Abstract

Textuality is a key concept in text linguistics. It is a property that a text must have in order to be regarded as a good text. In this paper, an attempt is made to arrive at the aspects of textuality utilized in online newspaper articles. More precisely, the paper endeavors to answer the following question: what are the most prevalent aspects of textuality utilized in this kind of discourse? As such, this paper aims at identifying the most common aspects of textuality exploited in online newspaper articles. Accordingly, it is hypothesized that cohesion, coherence, and informativity are the most prevalent aspects of textuality utilized in online newspaper articles. In order to achieve the aims of this paper and test its hypothesis, De Beaugrande and Dressler's (1981) model of textuality is utilized for the analysis of the data under scrutiny. The analysis is executed on six articles retrieved from online British newspapers, namely, The Independent, The Telegraph, The Guardian, and Express. Findings of the analysis validate the above mentioned hypothesis.

Keywords

textuality, cohesion, coherence, informativity, newspaper articles

1. Theoretical Underpinnings

1.1 Texts, Textuality, and Texture

There are various senses in which a piece of writing may be said to be a "text". The word "**text**" itself is the past participle stem of the Latin verb *texere*, to *weave, intertwine, plait*, or (of writing) *compose*. The English words "textile" and "texture" are also derived from the same Latin word. A "text" may thus be taken to be "a network of analytic, conceptual, logical, and theoretical relations that is woven with the threads of language" (Brown, 2003, p. 17).

Textuality is a key concept in text linguistics. Neubert and Shreve (1992, p. 30) define **textuality** as "the complex set of features that texts must have to be considered texts. Textuality is a property that a

complex linguistic object assumes when it reflects certain social and communicative constraints".

Texture, structure, and context are the three fundamental domains of textuality. The term "texture" refers to the different strategies employed to maintain consistency of meaning and so make a series of sentences work (i.e., both cohesive and coherent). The structure of texts is another factor that contributes to their coherence and helps them develop it. This aids us in our endeavor to distinguish between distinct compositional plans in what would otherwise just be a disjointed string of sentences. As a result, structure and texture work best together, with the former giving the overall framework and the latter the details. We rely on higher-order contextual aspects when dealing with structure and texture to identify how a given phrase sequence serves a particular rhetorical purpose, such as arguing or narrating and hence becomes "what we have called **text**" (Hatim & Mason, 1997, p. 71).

In essence, people are made up of shared experiences, bodies, and brains. The products that humans create using these resources are texts. Textuality is the result of shared cognitive mechanisms at work, as seen in readings and texts. Textuality's experienced quality is its texture (Stockwell, 2009, p. 45).

1.2 Model of Analysis

This paper follows the textuality model put forward by De Beaugrande and Dressler (in their well-known **Introduction to text linguistics** (1981)). According to these theorists (1981, p. 3) a text "...will be defined as a communicative occurrence which meets seven standards of textuality". The seven standards referred to are *cohesion, coherence, intentionality, acceptability, informativity, contextuality* and *intertextuality*.

1.2.1 Cohesion

The term "cohesion" refers to the connections between the parts of a sentence, or the actual words we hear and use, in a text (grammatically and lexically). According to Halliday and Hasan (1976, p. 11), cohesion exists "where the interpretation of any item in the discourse requires making reference to some other item in the discourse". De Beaugrande and Dressler (1981, p. 3) comment in this regard that the "...surface components depend upon each other according to grammatical forms and conventions, such that cohesion rests upon grammatical dependencies".

Jackson (1990, p. 252) refers to the fact that a "...bond is formed between one sentence and another because the interpretation of a sentence either depends on or is informed by some item in a previous sentence".

Halliday and Hasan (1976, p. 13) point out that the "concept of cohesion accounts for the essential semantic relations whereby any passage of speech or writing is enabled to function as text" and that this concept is systematized by means of five distinct different categories. These categories are: reference, substitution, ellipse, conjunction and lexical cohesion.

Reference as a cohesive device refers to the inclusion of a new item in the text and the succeeding reference to that same thing through a different item, typically a shortened form (commonly known as a "pro-form"). Pronouns, demonstratives, comparatives, a variety of lexical structures, even adverbs and

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adjectives may be implemented for this purpose (Ibid, p. 31).

In the case of **substitution**, a substitute is essentially used "in the place" of another word or expression to avoid using the same term or phrase twice. This makes it possible to shorten the text as well. Different types of substitution, such as nominal, verbal, and clausal substitution, can be identified (Ibid.).

In the process of **ellipsis,** elements of sentences are physically removed or omitted because the author assumes that the reader will fill in the gaps when the sentence is presented (Donnelly, 1994, p. 103).

With **conjunction**, we connect the propositions in adjacent sentences depending on specific semantic correlations "e.g., additive, adversative, causal and temporal" by using conjunctions and adverbs. The conjunctive items aid to "...reinforce and highlight the relationship between other elements of the text" (Ibid, p. 105).

Lastly, **Lexical cohesion** describes the semantic connections (such as collocation, antonymy, and synonymy) made by certain lexical items. Understanding this kind of coherence requires familiarity with certain semantic structures (ibid.).

1.2.2 Coherence

Coherence is likely the most important aspect of any type of textual analysis because a text cannot be considered "excellent" if it is not thoroughly comprehended. It might be challenging to define what exactly constitutes "coherence" in a writing. However, the definition offered by Neubert and Shreve (1992, p. 94) is extremely helpful: "A coherent text has an underlying logical structure that acts to guide the reader through the text" so that "it "sticks together" as a unit" (Hatch, 1992, p. 209) and generates the "feeling that a text hangs together, that it makes sense, and is not just a jumble of sentences" (McCarthy, 1991, p. 26).

1.2.3 Intentionality and Acceptability

Most people interested in text linguistics consider intentionality and acceptability to be a "pair" of principles. **Acceptability** refers to the attitude of the text recipient that the series of events should produce a cohesive and coherent text with some use or relevance for the recipient, such as to gain knowledge or offer cooperation in a plan. Similarly, **intentionality** focuses on the text creator's belief that the sequence of events should make up a text that is cohesive and coherent and serves to further the producer"s "intentions", such as disseminating information or achieving a predetermined goal (De Beaugrande & Dressler,1981, p. 13).

1.2.4 Informativity

The degree to which the instances of the text being given are anticipated versus unanticipated or known versus unknown is the focus of this textuality standard (Ibid., p. 14).

The amount of novel information in a text is measured by the **informativity** principle, and whether new information is recognized by the reader depends on their prior knowledge and basic understanding of the world (Jurin & Krišković, 2017, p. 24).

As a result, every text is at least partially informative; regardless of how predictable shape and content may be, there will always be a few unpredictable events that cannot be completely anticipated. A text with especially few information is likely to be unpleasant, boring, or even disregarded (De Beaugrande & Dressler, 1981, p. 14).

1.2.5 Contextuality

Contextuality (sometimes named situationality) emphasizes the vital role played by **context** in any communicative event. Every text, i.e., everything said or written, develops in a certain context of use. This effectively indicates that the participants" shared contextual knowledge determines the effectiveness and quality of communication in every situation where language is utilized. The fields of pragmatics and sociolinguistics both study this element of language use (Trask, 1995, p. 68).

1.2.6 Intertextuality

Intertextuality is a concept used to describe how all texts, whether they are written or spoken, formal or casual, creative or ordinary, are connected to one another in some way (Van Zoonen, 2017, p. 1). In addition, intertextuality is a manifestation of a neat connection between texts acknowledging text dependence on previously generated texts (Jurin & Krišković, 2017, p. 24).

2. Data Description and Analysis

2.1 Data Description

The data of this study is represented by *six* scientific articles retrieved from online British newspapers, namely, *The Independent, The Telegraph, The Guardian,* and *Express*.

2.2 Method of Analysis

This work implements De Beaugrande and Dressler's (1981) model of textuality which has been explained in section (1.2) above for the analysis of the data under scrutiny.

2.3 Data Analysis

Text (1)

In this article, (see the appendix), the journalist is discussing the finding of a scientific research which suggests that women need more sleep than men because of their complex brains. The journalist, in this article, utilizes many aspects of textuality to make this peace of written discourse more efficient and hence more attractive.

The whole article has a very well organized internal structure, in that the sentences and phrases of the texts are neatly tied to each other through the use of various cohesive devices such as cross-reference using pronouns, ellipsis, and conjunctions:

*-**Women** need more sleep than men because of **their** "complex" brains.*

*-Women's brains work harder than **men's** (i.e., than men's brains).*

*-**You've got two choices: **Either** emerge from the covers **and** get a head start to the day, **or** you try to go back to sleep. Women tend to require more sleep than men **because of** their "complex" brains, according*

to research.

Moreover, the article is coherent in that all its parts are logically tied to each other in that they all discuss one unified topic which is how research found that women need more sleep than men. Also, the article is completely *informative* in that it presents new and valuable information to the reader. At the beginning of the article, the journalist attempts to present the new and valuable information before the old or known one so he uses the grammatical structure of fronting:

-*Women need more sleep than men because of their "complex" brains, research suggests*, (instead of saying: *research suggests that women need more sleep…*).

Text (2)

In this article, (see the appendix), which is taken from *The Telegraph*, the journalist is discussing the environmental disaster facing Britain's ash trees because of a "bright green beetle". The internal organization of the article is well structured and all the parts of the text are neatly tied to each other through the use of cohesive devices such as *cross-reference via pronouns*, *conjunction,* and *ellipsis*:

-**The insect** *has passed through Denmark and is believed to have reached Sweden. In 2002* **it** *was accidentally introduced to North America, where* **it** *has killed millions of ash trees.*

-Ash is Britain's most common hedgerow tree **and** the second most common tree in woodland, **afte**r the oak.

-*The insect has passed through Denmark and (-) is believed to have reached Sweden*, (i.e., the insect or it is believed…).

It can be clearly noticed that the article is coherent in that all its parts are logically connected to each other because they are all dealing with a unified topic which how ecologists found that the beetle is making serious damage in ash trees which Britain's most common and valuable trees. Moreover, the article is informative in that it introduces new and valuable information to the reader. The journalist presents new and important information through the grammatical structures of *fronting* and *passivization*:

-*Bright green beetle will wipe out Britain's ash trees, scientists warn*, (instead of saying: *scientists warn that Bright green beetle will…*).

-**The insect** *has passed through Denmark and* **is believed** *to have reached Sweden.*

Text (3)

In this article, (see the appendix), which is taken from *The Guardian*, the journalist is tackling the report of wildlife experts about the loss of "England's last golden eagle" and it is feared that the bird is dead. The article is well organized syntactically and its internal structure is well presented through the use of such cohesive devices as *reference via pronouns* and *conjunction*:

-**Wildlife experts** *say* **the bird** *likely died of natural causes after* **they** *fail to spot* **him** *at* **his** *usual haunts in the Lake District.*

-*When the eagle didn't appear last month we thought there was a chance he might be hunting in a nearby valley* **but** *over the past few weeks we've been gradually losing hope.*

Moreover, the article is obviously coherent in that its parts are logically linked to each other and they are not just series of jumbled sentences. The linkage is manifested in the discussion of one integrated topic, namely the loss of "England's last golden eagle" and its expected death. The article is informative in that it conveys new and valuable information to the readers. The journalist handles the presentation of new and important information through the exploitation of such grammatical structures as *fronting* and *passivization*:

-*England's only resident golden eagle is likely to have died after failing to appear this spring, wildlife experts fear*, (instead of saying: *wildlife experts fear that England's only resident golden eagle is…*).

-***The eagle was believed*** *to have been around 20 years old and had lived alone since the death of his mate in 2004.*

Text (4)

In this article, (see the appendix), which is taken from *The Independent*, the journalist is discussing the findings of a scientific research which can solve the old question of "how inherently good humans are—or aren't?" The article is well organized and its internal syntactic structure is knitted through the use of such cohesive devices as *reference via pronouns, conjunction,* and *ellipsis*:

-*However,* ***researchers*** *at the University of California, Los Angeles have used science to try and find out.* ***They*** *came to the conclusion that "our altruism may be more hard-wired than previously thought".*

-*They also looked at the dorsolateral* ***and*** *dorsomedial parts of the prefrontal cortex, which regulate behaviour* ***and*** *control impulses.*

-*The more we experience the states of others, the more we appear to be inclined to treat them as we would ourselves* (i.e., as we would ourselves like to be treated).

The article's several segments are connected logically by the fact that they all address the same subject which is the finding of a scientific research which suggests a potential method of encouraging less selfish and more altruistic characteristics of the human brains. Moreover, the article is informative in that it implements new and valued information. The journalist manifests informativity through the presentation of new and significant information by exploiting certain grammatical devices such as *fronting*:

-*Altruism may be "hard wired" into the human [brain](), scientists have suggested*, (instead of saying: *scientists have suggested that altruism may be…*).

Text (5)

This article, (see the appendix), is dealing with the finding of a documentary team which came up with the conclusion that Shakespeare's skull may have been removed from his grave through the use of high-tech radar. The sentences and phrases in the text under examination are neatly connected to one another having a very well ordered internal structure achieved by the use of various cohesive devices such as cross-reference using pronouns and conjunctions:

-***A team*** *performed a ground-penetrating radar scan on the grave at the Holy Trinity Church in Stratford-upon-Avon.* ***They*** *found evidence of "a mysterious and significant repair to the head end of*

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William Shakespeare's grave".

-*Frank Chambers raided Shakespeare's vault in the chancel of Holy Trinity Church **and** left Shakespeare's skull in a church in Worcestershire.*

It is obviously noticeable that the article is coherent in that all its portions are logically connected to each other because they are all dealing with a amalgamated topic which is how a documentary team found that Shakespeare's skull may have been removed from his grave. The article is informative in that it conveys new and valuable information to the readers. The journalist manages the presentation of new and important information through the exploitation of such grammatical structures as *fronting* and *passivization*:

-*Shakespeare's skull may have been removed from grave, documentary finds*, (instead of saying: *documentary finds that Shakespeare's skull…*).

-*The Bard and his loved ones were wrapped in winding sheets.*

Text (6)

In this article, (see the appendix), the journalist is discussing the finding of some astronomy research conducted by a Harvard professor who suggests that we could find ALIENS living in giant clusters of stars on the edge of our milky way. The article is well-structured, and its internal syntactic architecture is build up through the use of certain cohesive elements like *reference via pronouns* and *conjunction*:

-*ALIENS are living in giant clusters of stars and scientists will be able to find **them** on the edge of our Milky Way.*

-*The sun is 4.6 billion years old **and** has allowed us to evolve to intelligent beings.*

Additionally, the text is coherent in that each of its components is logically connected to the others as they all address the same subject which is the finding of an astronomy research that suggests the existence of aliens living in giant clusters of stars on the edge of the Milky Way.

As for the informativity of the article, the journalist at the beginning of the text makes a *knowledge deficit* by using the demonstrative "this" without previously mentioning its co-referent.

-*THIS is where we should be searching for aliens.*

This deficit can be filled if we complete reading the article to find out that "this" refers to "giant clusters of stars". The journalist also uses fronting to present new and important information before the old one:

-*THIS is where we should be searching for aliens, according to Harvard professor,* (instead of saying: *according to Harvard professor, THIS is where we…*).

3. Concluding Remarks

The findings of this study may be summed up as follows:

1) The hypothesis set at the beginning of this paper which reads: "*cohesion, coherence, and informativity are the most prevalent aspects of textuality utilized in online newspaper*

articles", has been validated in that these aspects of textuality are extensively appealed to in the articles analyzed.

2) Moreover, it has been revealed that *informativity is the most common aspect of textuality exploited in this kind of discourse*. It is frequently utilized in the articles analyzed.

3) It has been also noticed that the journalist frequently resorts to such cohesive devices as *reference via pronouns, conjunction*, and *ellipsis* as a means of achieving textuality through cohesion.

4) The journalist handles the presentation of new and important information through the exploitation of such grammatical structures as *fronting* and *passivization*.

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(Web Resource 1)

Retrieved   from http://www.independent.co.uk/life-style/health-and-families/health-news/women-need-more-sleep-because-of-their-complex-brains-research-suggests-a6925266.html

(Web Resource 2)

Retrieved   from

http://www.telegraph.co.uk/news/2016/03/23/bright-green-beetle-will-wipe-out-britains-ash-trees-scien
tists/

(Web Resource 3)

Retrieved   from

http://www.theguardian.com/environment/2016/apr/14/englands-last-golden-eagle-feared-dead

(Web Resource 4)

Retrieved   from

http://www.independent.co.uk/news/science/human-brain-could-be-hard-wired-towards-altruism-scient
ists-say-a6941041.html

(Web Resource 5)

Retrieved   from

http://www.telegraph.co.uk/tv/2016/03/23/shakespeares-skull-may-have-been-removed-from-grave-doc
umentary/

(Web Resource 6)

Retrieved   from

http://www.express.co.uk/news/science/654305/alien-globular-cluster-ET-milky-way-galaxy-harvard

Appendix

Online Newspaper Articles

Text (1)

Women need more sleep than men because of their "complex" brains, research suggests

As women's brains work harder than men's, they also need more sleep

By: Will Worley

The Independent/March 2016

On mornings like this, you've got two choices: Either emerge from the covers and get a head start to the day, or you try to go back to sleep.

Women tend to require more sleep than men because of their "complex" brains, according to research.

Scientists found that around 20 minutes more sleep was needed by women compared to men - and said this was thought to be because the female brain works harder during the day.

The study was carried out on a sample set of 210 middle-aged men and women.

"One of the major functions of sleep is to allow the brain to recover and repair itself", study author Jim Horne, a sleep expert formerly director of the Sleep Research Centre at Loughborough University, told the *Mail Online*.

"During deep sleep, the cortex—the part of the brain responsible for thought memory, language and so on—disengages from the senses and goes into recovery mode".

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Prof Horn said the amount of sleep was necessitated by the complexity and intensity of brain activity during the day.

He said: "The more of your brain you use during the day, the more of it that needs to recover and, consequently, the more sleep you need".

"Women tend to multi-task—they do a lot at once and are flexible—and so they use more of their actual brain than men do. Because of that, their sleep need is greater".

"The average is 20 minutes more, but some women may need slightly more or less than this".

However, he said men who have complex jobs which involve a lot of "decision-making and lateral thinking" are also likely to need more sleep than the average male.

The study also found that poor sleep among women was linked to a number of side effects. Increased levels of psychological distress and greater feelings of hostility, depression, and anger were all found in women who slept poorly, but not men.

(Web Resource 1)

Text (2)

Bright green beetle will wipe out Britain's ash trees, scientists warn

By: Leon Watson

The Telegraph/ March 2016

A bright green parasite will put the final nail in the coffin of Britain's ash tree population after laying waste to woodland across Europe, scientists warned on Wednesday.

The arrival of the emerald borer beetle, originally from Asia, is "inevitable" and with the fungal disease ash dieback will create a "double whammy" that could make ash trees extinct, a comprehensive new analysis found.

Ash is Britain's most common hedgerow tree and the second most common tree in woodland, after the oak.

There are around 157,000 hectares of ash woodland with 68 million trees as well as a further 12 million ash trees outside those areas.

But scientists say it will not be able to withstand the arrival of the emerald ash borer, which has been steadily spreading west.

The adult beetles feed on ash leaves and do little damage, but the larvae bore under the bark and into the wood, killing the tree.

Recorded in Moscow in 2003, the insect has passed through Denmark and is believed to have reached Sweden.

In 2002 it was accidentally introduced to North America, where it has killed millions of ash trees.

Peter Thomas, a tree ecologist at Keele University who carried out the analysis, said: "Between ash dieback and the emerald ash borer, it is likely that almost all ash trees in Europe will be wiped out, just as the elm was largely eliminated by Dutch elm disease.

"The two together are a double whammy".

"It is only a matter of time before it spreads across the rest of the Europe—including Britain.

"Our European ash is very susceptible to the beetle and the beetle is set to become the biggest threat faced by ash in Europe—potentially far more serious than ash dieback".

"It is quite a big beetle, originally from Asia, and can fly a long way. In the past, insect diseases have spread very quickly".

Thomas's analysis was published on Wednesday in the Journal of Ecology.

Britain's ash trees are already battling dieback, which was first spotted in the UK in 2012 and is feared to threaten 95 per cent of the species.

It causes leaf loss, crown dieback and bark lesions in affected trees.

Once a tree is infected the disease is usually fatal, either directly or indirectly by weakening the tree to the point where it succumbs more readily to attacks by other pests or disease.

It remains unclear how many ashes will die, as it can take years for mature trees to succumb. Its spores can be blown more than 10 miles in the wind and survive on woodland floors for four or five years.

(Web Resource 2)

Text (3)

England's last golden eagle feared dead

Wildlife experts say the bird likely died of natural causes after they fail to spot him at his usual haunts in the Lake District

By: Jessica Aldred

The Guardian/April 2016

England's only resident golden eagle is likely to have died after failing to appear this spring, wildlife experts fear.

The bird, which has been a resident at Riggindale near Haweswater, Cumbria, since 2001, has not seen by RSPB staff since last November, and would normally be seen at this time of year building a nest and displaying to attract a mate.

Lee Schofield, site manager at RSPB Haweswater, said: "When the eagle didn't appear last month we thought there was a chance he might be hunting in a nearby valley but over the past few weeks we've been gradually losing hope".

The eagle, who did not have a name, was believed to have been around 20 years old and had lived alone since the death of his mate in 2004.

"We will probably never find out what happened to him but as he was ... an advanced age for an eagle, it"s quite possible that he died of natural causes", Schofield said.

"His disappearance marks the end of an era as he has been an iconic part of the Haweswater landscape for the past 15 years. During this time, thousands of visitors have travelled from across the country hoping to catch a glimpse of him at the Riggindale eagle viewpoint".

Adrian Long, of Birdlife International, said it was incredibly sad news. "Raptors are at the top of the food chain, and eagle species need big areas to live. We must remember that decades of altering our landscape and habitats has caused this iconic bird to no longer patrol the skies of England. I hope that eagles will one day be seen flying again the hills of England again, with perhaps some of the Scottish population moving south".

Birder Alan Tilmouth, who broke the news on the @Birdguides Twitter account on Wednesday evening, said: "The Haweswater golden eagles probably provided many thousands of birders their first experience with an iconic bird, for many it will be the only golden eagle encounter they have had in England.

"We'll wake tomorrow to a country less wild than before, nature one step further from us, one step closer to simply being a shadow of itself".

Dawn Balmer, head of surveys for the British Trust for Ornithology, said: "It seems likely that this magnificent bird has died of natural causes, and in this wild landscape it's unlikely a corpse will be found. We can only hope that the small and vulnerable golden eagle population in south-west Scotland increases and expands in the future, and that some eagles disperse into England".

The RSPB said the eagle was not tagged or ringed as it was too hard to catch them.

Golden eagles arrived in the Lake District from Scotland in the late 1950s and a pair first bred at Haweswater in 1969.

There are an estimated 440 annual breeding pairs in the UK, which are mostly found in the wide-open moorlands and mountains of Scotland.

Eagles have traditional territories and nesting places which may be used by several generations. They have been illegally killed in the past and are still occasionally poisoned, or have their nests robbed.

The original male died in 1976 and was replaced by Britain's oldest known eagle who lived until he was at least 30 years old. In turn, he was replaced in 2001-02 by the most recent male. The original female was replaced in 1981 by the last female who died in 2004.

Although it is unlikely that golden eagles will take up residence again at Haweswater in the near future, the conservation organisation is undertaking an extensive programme of habitat restoration which it hopes will eventually encourage eagles to nest again at the site.

Schofield said: "At the moment the Lake District isn't particularly attractive to golden eagles as there is a shortage of suitable habitat and food. By restoring a range of natural habitats at Haweswater, we hope this will lead to an increase in wildlife, including birds and small mammals, which would provide a sustainable food source for golden eagles".

(Web Resource 3)

Text (4)

Human brain could be "hard-wired" towards altruism, scientists say

"The more we experience the states of others, the more we appear to be inclined to treat them as we would ourselves"

By: Will Worley

The Independent/March 2016

Altruism may be "hard wired" into the human brain, scientists have suggested.

How inherently good humans are—or aren't—has been an issue which has occupied philosophers for centuries.

However, researchers at the University of California, Los Angeles (UCLA) have used science to try and find out.

They came to the conclusion that "our altruism may be more hard-wired than previously thought," according to Leonardo Christov-Moore, a postdoctoral fellow at UCLA's Semel Institute of Neuroscience and Human Behaviour.

The research also indicates a potential method of encouraging less selfish and more altruistic characteristics, said senior author Marco Iacoboni, a UCLA psychiatry professor.

"This is potentially ground-breaking," said Prof Iacoboni.

The claims follow the findings of two studies.

In the first study, researchers analysed brain activity in 20 participants.

This was done by scanning participants" brains while they were shown a video of a hand being poked with a pin and asked to imitate photographs of faces displaying a range of emotions.

In particular, the scientists looked at the cluster of parts of the brain known as the amygdala, somatosensory cortex and anterior insula. These are associated with experiencing pain and emotion and imitating other people.

They also looked at the dorsolateral and dorsomedial parts of the prefrontal cortex, which regulate behaviour and control impulses.

Participants then played the "dictator game", a task often used by social scientists to study decision making.

They were given money—$10 per round for 24 rounds—to either keep for themselves or share with a stranger. Recipients were Los Angeles residents whose real ages and income levels were used in the experiment.

After each participant had completed the task, researchers compared their pay outs with their brain scans.

Participants with the most activity in the prefrontal cortex – associated with behaviour and impulse control - proved to be the least generous, giving away an average of only $1 to $3 per round.

But the one-third of the participants who had the strongest responses in the areas of the brain associated with perceiving pain and emotion and imitating others were the most generous.

On average, these subjects gave away approximately 75 per cent of their money.

Researchers referred to this tendency as "prosocial resonance" or mirroring impulse, and they believe the impulse is a primary driving force behind altruism.

"It's almost like these areas of the brain behave according to a neural Golden Rule," Mr. Christov-Moore

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said.

"The more we tend to vicariously experience the states of others, the more we appear to be inclined to treat them as we would ourselves".

In the second study, researchers looked at if the behaviour and impulse controlling prefrontal cortex also restricts the altruistic mirroring impulse.

A non-invasive procedure called theta-burst Transcranial Magnetic Stimulation was used on 58 participants to numb brain activity in specific areas.

Participants with dumbed-down activity in the prefrontal cortex were found to be 50 per cent more generous than participants who were numbed elsewhere in the brain.

"Knocking out these areas appears to free your ability to feel for others", Christov-Moore said.

The findings of both studies suggest potential avenues for increasing empathy, which is especially critical in treating people who have experienced desensitizing situations like incarceration or war.

"The study is important proof of principle that with a noninvasive procedure you can make people behave in a more prosocial way", Prof Iacoboni said.

(Web Resource 4)

Text (5)

Shakespeare's skull may have been removed from grave, documentary finds

By: Alice Vincent

The Telegraph/March 2016

In 1879, an unconfirmed report in the press claimed that William Shakespeare's skull was stolen from his shallow grave by trophy hunters 85 years earlier. Now, a high-tech radar investigation into the Bard's grave suggests that the story is true.

The Channel 4 documentary Secret History: Shakespeare's Tomb, follows a team as they perform a ground-penetrating radar scan on the grave at the Holy Trinity Church in Stratford-upon-Avon.

They found evidence of "a mysterious and significant repair to the head end of William Shakespeare's grave". The archaeologists' theory is that the grave was disturbed previously, causing the floor to sink and needing repair.

Kevin Colls, the archaeologist who leads the team, says in the documentary: "We have Shakespeare's burial with an odd disturbance at the head end and we have a story that suggests that at some point in history someone's come in and taken the skull of Shakespeare.

"It's very convincing to me that his skull isn't at Holy Trinity at all".

It is not the only startling finding from the radar examination, which has discovered that Shakespeare and his family are buried in a shallow grave under the church floor, rather than the large family vault where their bodies were thought to have been laid. The playwright, along with his wife Anne Hathaway and other members of the family are buried less than a metre below ground.

Colls' and his team also believe that The Bard and his loved ones were wrapped in winding sheets or

shrouds and buried in soil, rather than in a formal coffin, as there was no evidence of metal—which would indicate the presence of coffin nails—in the area of the grave.

Two magazine articles—thought to be written by a former vicar at St Leonard"s Church, Worcester—published in 1879 and 1884, claimed that a doctor called Frank Chambers raided Shakespeare's vault in the chancel of Holy Trinity Church and left Shakespeare's skull in a church in Worcestershire.

St Leonard's Church, located 15 miles north-west of Stratford in Beoley, is home to a lone skull in a sealed crypt that some have thought could be Shakespeare's. The current vicar, Rev Paul Irving, sought permission from the Church of England's Consistory Court to have the skull tested for DNA, but had the application rejected on a lack of firm evidence.

Barrister Chancellor Myrnors wrote that there was no "scholarly or other evidence" to support the theory, even dismissing it as a "piece of Gothic fiction".

But, following the findings at Holy Trinity Church, archaeologists were granted permission to carry out forensic anthropological analysis on the mysterious skull at Beoley. The results showed that it did not belong to Shakespeare, but an unknown woman who was in her seventies when she died.

For now, Colls maintains that the location of Shakespeare's skull is unknown, with Colls admitting that "thinking of the findings send**s** shivers down my spine".

The Rev Patrick Taylor at Holy Trinity Statford, however, maintains that Shakespeare's skull remains under the church's flagstones. "We are not convinced that there is sufficient evidence to conclude that his skull has been taken," he said in a statement.

"We intend to continue to respect the sanctity of his grave, in accordance with Shakespeare's wishes, and not allow it to be disturbed. We shall have to live with the mystery of not knowing fully what lies beneath the stone".

(Web Resource 5)

Text (6)

THIS is where we should be searching for aliens, according to Harvard professor

ALIENS are living in giant clusters of stars and scientists will be able to find them on the edge of our Milky Way, a leading astronomer has said.

By: Sean Martin

Express/March 2016

Groups of stars called globular clusters, have been around more than twice as long as the sun and Earth, meaning any potential alien life could have evolved to be MORE advanced than humans.

Dr. Rosanne Di Stefano from the Harvard-Smithsonian Center for Astrophysics in the US, made the bold claims in an article about star clusters.

Globular clusters are areas in the universe which are densely packed with ancient stars, the majority of which are older than our sun.

The "halo" region of the Milky Way—the part beyond the catherine wheel arms of our galaxy—contains globular clusters which have stars as old as 10 billion years old.

Considering the sun is 4.6 billion years old and has allowed us to evolve to intelligent beings, Dr Di Stefano believes 10 billion years" worth of evolution could mean that the potential aliens are even more advanced than us.

Additionally, the stars in this region are close together, meaning it takes light as little as one month to travel from one star to another, whereas the closest star to Earth, aside from the sun, is 4.2 light years away.

Dr. Di Stefano said due to the close proximity of the stars, "it would also be easier for a civilisation to explore and even set up outposts on other worlds".

Only one planet has been found in a globular cluster—the 12.4 billion-year-old Methuselah, named an exoplanet because it isn't in our solar system.

But Dr. Di Stefano wrote in the Sky at Night magazine: "It would be strange if there were not many others.

"Of course, this is all conjecture. We don't know whether there is alien life in such clusters.

"But globular clusters would be a good place to look and might be the first place where intelligent life is identified in our galaxy".

However, others believe we should focus the search for alien life on Earth's transit zones.

A report recently published in Astrobiology states scientists should hone in on the areas of space that we can see, and thus potential aliens may be able to see us.

Astrophysicists René Heller and Ralph Pudritz's study states alien civilisations may be looking for extra-terrestrials in the same way we are tracking exoplanets—by monitoring their shadows as they pass in front of their host star.

They write: "Our planet may be seen by distant observers against our Sun's light, allowing them to detect us.

"As an ultimate consequence, even if our species chose to remain radio-quiet to eschew interstellar contact, we cannot hide from observers located in Earth's solar transit zone, if they exist".

<div align="right">(Web Resource 6)</div>