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A SURVEY RESEARCH TO IDENTIFY THE NEUROPSYCHOLOGICAL IMPLICATIONS OF THE EFFECTS OF FICTIONAL SHOWS AND MOVIES ON LIFE'S REALITY

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Abstract

The evolution of technology has made different forms of fictional narratives easily accessible in most parts of the world. As the pandemic restricted the activities of people, there was a drastic increase in the consumption of all forms of media ranging from books to movies. The current study inspects the effects of fictional literature and films on consumers. The study was conducted in the online mode with 73 participants who filled up a questionnaire form which was circulated through various social media platforms. The participants involved in this study were from 13 to 34 years of age. The online questionnaire consisted of two sections; section one consisted of questions based on an individual's favorite fictional character and section two was a task-based activity aimed to check the extent of involvement with a fictional character from a short story. A five-point Likert scale was used to measure the results. Results from section one indicated that most of the participants were positively influenced by their favorite fictional character, identified with them, and imitated traits of the character. Results from section two showed that a significant number of the participants were empathetic towards the protagonist of the short story. Additionally, most of the readers were tolerant towards controversial views in fictional literature. Overall, the study findings reveal that fictional characters influence individuals positively if not neutral.

Keywords: Fictional, literature, film, character, neuropsychological

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Introduction

Easy access to a variety of media has brought consumers closer to the fictional world. With online modes of work and education, many also rekindled their habit of reading books. A report from Nielsen-Impact of COVID 19 on India Book Consumers states about an increase in reading time, from nine hours per week to 16 hours per week during the pandemic (Kirpal, 2021). Over-the-top (OTT) platforms have also become popular among Indians during the COVID 19 pandemic. As per a report published by MICA's Center for Media and Entertainment Studies (CMES), the consumption of media is highest among the age group of 15-35. As of 2020, there were 350 million OTT consumers and the viewership is expected to grow to up to 500 million in 2023(MICA CMES, 2020). With different forms of media available providing easy access to a myriad fictional world, we hypothesize it to affect consumer behavior. In a study by Oatley (2012), he states, "Works of fiction are simulations that run on minds." His work also mentions that reading fiction helps to develop social skills such as empathy and the *Theory of Mind*.

This study in this paper aims to identify the *Effects of Fiction on Reality*. We study the extent to which fiction may affect the personality of a consumer. Individuals engaging with the characters are affected by two kinds of behaviors as noted by Rain & Mar, (2021), which are:

- Para-social relationships – Exposure to the character leads to a prolonged engagement. It develops gradually as the character continues to share their story.
- Identification – The audience identifies with the character and gets involved in the story through the lens of the character.

Identification is one effect that fictional media has on its consumers. The consumers get involved with the emotions, happenings, thoughts, actions of the characters and feel these as their own. Although it was known that fiction affects the brain, studies are now conducted to gather data about how this has an impact on the personality and the behavior of an individual. Individuals have also reported having made career choices inspired by some famous characters from popular series and movies (Broom et al., 2021).

According to a similar study by Cheetham et al, certain brain areas have been identified using brain imaging techniques (Cheetham et al., 2014). These brain areas and their role in context to our research are as follows:

- Anterior Insula (AI) – The right insula is associated with an affective-perpetual form of empathy and the left insula is associated with a cognitive-evaluative form of empathy (Li et al., 2019).
- The dorsal medial prefrontal cortex (dmPFC) – This brain region is associated with social cognition. It is tuned for observing social features during everyday events (Wagner et al., 2016).
- Right Temporoparietal junction(rTPJ) – The region is involved in the ability to refocus attention from a deviant stimulus. It is also associated with social cognition tasks which

include perspective taking or empathy. And also plays an important role in distinguishing self from non-self (Krall et al., 2014; Cheetham et al., 2014).

- The dorsolateral prefrontal cortex(dlPFC) – The area is involved in the Theory of Mind (TOM) development and other social information processing (Hertrich, Dietrich, Blum, & Ackermann, 2021).
- Anterior Cingulate Cortex(ACC) – It is involved with psychological processes such as empathy, regulation of emotions, decision making, etc. (Apps, Rushworth, & Chang, 2016).
- The ventral medial prefrontal cortex (vMPFC) -This area is associated with differentiating self against nonself – actions and emotions (Hiser & Koenigs, 2018). The regions show a greater extent of neural overlap in consumers who show a greater identification with fictional characters (Broom et al., 2021).

The data was collected by the means of a questionnaire-based survey. The results of this research will serve to supplement and support ongoing research in this field. It will also help reiterate the need to inculcate a reading habit in individuals or to expose themselves to the world of fiction. This will help individuals be better citizens who have better social cognitive skills and an open mind to new thoughts and changes.

Methodology

Participants

All participants belonged to the age of 13 or above. The description of the form was framed such that it would attract fiction consumers from any form of media books/series/movies etc. The form gained a total of 73 responses, of which 48 were female and 25 were male.

The Survey

An online survey was conducted via Google Forms (carefully encrypted with institutional email and cloud storage). The form accepted responses for two days and consisted of two separate sections. The responses were anonymous (Link to the survey form- https://forms.gle/5VPiavfsLCHF1Z2z9).

The survey form consisted of open-ended questions that required participants to express their opinions. However, many questions were answered on a Likert scale. A Likert scale is an assessment tool widely used by psychologists and sociologists in questionnaire development to present a diverse range of perspectives based on a number scale. The scale considers no assumption of equal intervals between the opinions. The scale has the extremes of opinions on either end and the strength of opinions dilutes towards the center of the scale. A 5-point Likert scale is thus used in this study to determine the extent to which an individual agrees to the questionnaire statements (Bowling, 2014) (Refer to Table I).

Table I. An interpretation of Likert scale values for the parameters measured.

	Likert scale values	Parameters measured	
		Strength of identification	Extent of agreement
Interpretation of scale values	1	very weak	Strongly disagree
	2	weak	disagree
	3	Neither weak nor strong	Neither disagree nor agree
	4	strong	agree
	5	very strong	Strongly agree

Section 1

This section consisted of questions to check the effect of fictional films on the viewers. It contained seven questions, of which two questions, were to collect information about the participant's age and biological sex. In addition, five questions were asked on their areas of interest, such as their favorite fictional characters with whom they resonate and the various factors they like about these fictional characters. The results of these targeted questions were obtained in a bar graph format to interpret and comprehend the trends in these groups of individuals in their similarity of factors they like in those characters.

Section 2

This section was task-based and aimed to check the extent of identification from fictional books as the media. The section opens with "The Little Matchgirl", a short story by Hans Christian Andersen. An emotional short story about a little girl child was chosen to act as a stimulus to increase brain activity in the target regions of the brain. The story was followed by a series of questions- some were to know about the frequency of reading, while the rest were directed to collect information about the participant's involvement in the story and the extent of identification with the character of the story. Four questions were adopted from the Interpersonal Reactivity Index(IRI) - subscale Fantasy(FS). The IRI is a widely used tool to retrieve information about identification from an individual (Pino & Mazza, 2016).

The data collected was used to study various aspects of social cognition and identification. The results were helpful to observe the extent to which fictional characters have on the life of an individual.

Results

With 73 responses that were received to the online questionnaire, the following results and discussions have been developed and studied.

Effect of fictional films on reality

58 fictional characters were selected in total. The fictional characters selected the most were Naruto Uzumaki (Naruto anime series) and Iron man (Avengers film series), both of which were selected by three respondents. Several other characters such as Hermione Granger (Harry Potter), Jake Peralta (Brooklyn nine-nine), Mickey mouse (Mickey mouse cartoon), etc. were selected, all of which are displayed in table Ⅱ below.

Table Ⅱ. The table shows the fictional character, the movie/anime/series/cartoon it belongs to, and the number of respondents who selected each

Fictional character	**Movie/series/ anime/cartoon**	**Number of respondents**	**Fictional character**	**Movie/series/ anime/cartoon**	**Number of respondents**
Naruto Uzumaki	Naruto	3	Ricky	High School Musical	1
Iron man	Avengers	3	Loki	Loki	1
Hermione	Harry Potter	2	Thor	Thor: Ragnarok	1
Jake Peralta	Brooklyn nine-nine	2	Lola Bunny	Space Jam	1
Mickey mouse	Mickey mouse	2	Levi Ackerman	Attack on Titans	1
Captain America	Avengers	2	Jiang Yanli	The Untamed/Mo Dao Zu Shi	1
Elsa	Frozen	2	Elizabeth Bennett	Pride and Prejudice	1
Lucifer Morningstar	Lucifer	2	Rapunzel	Rapunzel	1
Doraemon	Doraemon	1	Becket	Castle	1
Harry Potter	Harry Potter	1	Elena	The vampire diaries	1
Scarlet Witch	Avengers	1	Pain	naruto	1

Amy Santiago	Brooklyn nine-nine	1	Joey	Friends	1
Ratatouille	Ratatouille	1	Lisbon	Mentalist	1
Baymax	Big hero 6	1	Spiderman	Spiderman	1
Gopi	(FIR)	1	Winnie	Winnie the pooh	1
Ross Geller	Friends	1	Miguel River	Coco	1
Margaret	The proposal	1	Bokuto Koutarou	Haikyuu	1
Yennefer	The Witcher	1	Spiderman	Spiderman	1
Thomas Shelby	Peaky Blinders	1	Winnie	Winnie the pooh	1
Patrick Jane	The Mentalist	1	Miguel River	Coco	1
Monica Geller	FRIENDS	1	Bokuto Koutarou	Haikyuu	1
Daenerys Targaryen	Game of Thrones	1	Spiderman	Spiderman	1
Sheldon Cooper	The Big Bang Theory	1	Winnie	Winnie the pooh	1
Percy Jackson	Percy Jackson	1	Miguel River	Coco	1
Ron Weasley	Ron Weasley	1	Bokuto Koutarou	Haikyuu	1
Nami	One piece	1	Spiderman	Spiderman	1
Andy Dufresne	Shawshank redemption	1	Winnie	Winnie the pooh	1
Red	Shawshank redemption	1	Miguel River	Coco	1
			Bokuto Koutarou	Haikyuu	1

Imitated traits of the fictional character

The most imitated trait was found to be the style of talking (56.2%) while the least imitated trait was the appearance (19.2%) of the fictional character. Body language was the second most imitated trait (39.7%), while quirks of the character were imitated the third most (32.9%). 27.4% of the participants responded that they have never imitated any trait of the character (refer to figure 1).

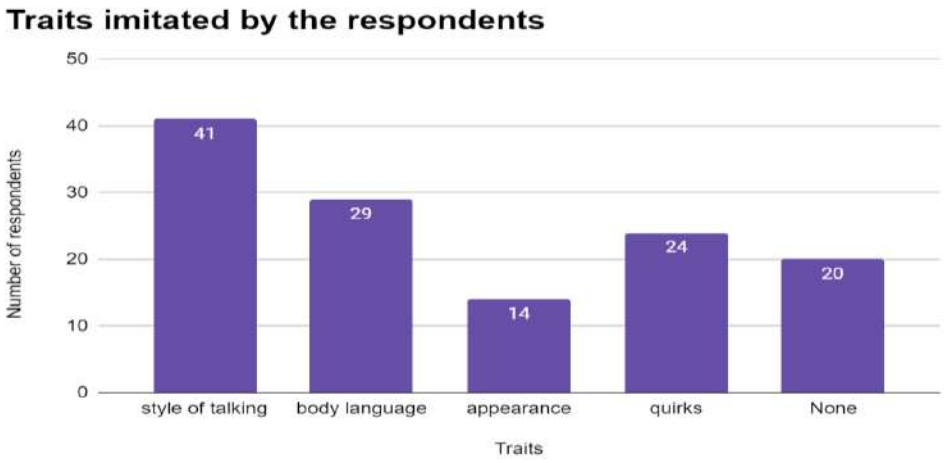

Fig. 1. The bar graph represents the traits imitated by the respondents. The number of respondents is represented on the y-axis and traits on the x-axis.

Significant effects of the character on the respondents

12.3% of the respondents did not identify the character's influence as negative or positive. 87.6% of the respondents stated positive effects while none stated any negative effects (refer to table Ⅲ). Some of the positive effects stated include improved sense of humor, making the participant a better listener, observer, self-reliant, etc. Some of the respondents stated to have made decisions and learned moral values on the influence of the character.

Table Ⅲ The table shows how the character affected the participant. A rating of 1 or 2 was considered as a negative effect, 3 was considered neutral and 4 or 5 was considered as positive.

	negative		**neutral**	**positive**	
Scale	1	2	3	4	5
Number of respondents	0	0	9	35	29

Strength of identification

Results obtained showed that 15.1% of the participants chose the highest level of identification (very strong) with the character and 42.5% reported a strong identification. 4.1% chose the lowest level of identification with the character while 8.2% reported a weak identification. 30.1% did not distinguish their identity as strong or weak. Refer to figure 2.

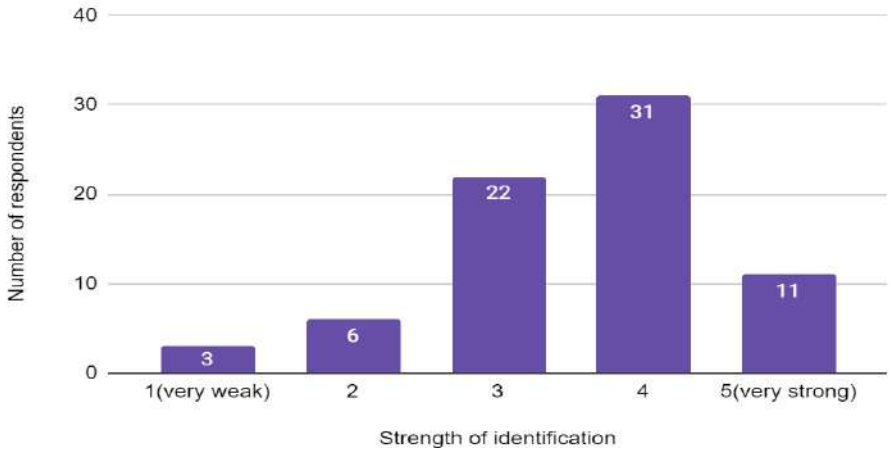

Fig. 2. The bar graph represents the strength of identification of the respondents with the selected fictional character. The number of respondents is represented on the y-axis and the strength of identification is on the x-axis.

Effect of literary fiction on reality

Out of the 73 participants, 24.7% of participants read fictional books often, every week, or every month. Whereas 75.3% were infrequent readers.

Visualization of the fictive narration

41.1% of participants strongly agreed that they were able to visualize descriptive parts of the story using their imagination. 37% agreed they were able to imagine, whereas 19.2% of participants chose the option neutral. Importantly, 2.8% of the participants could not visualize the story.

Beliefs and recommendation of the story-

This section checked how tolerant participants were towards others' beliefs and whether they chose to recommend the story or not. Tolerance is based on the freedom that lets the recommender analyse independently their personal opinions and beliefs. 82.2% of participants chose that they would recommend the book whether or not they agree with the beliefs of the story. 17.8% of participants would not consider recommending the book if they did not agree with the beliefs of the story.

Empathy

The section provided a quick stimulus to check if they felt the character's pain. 13.7% of participants strongly agreed that they could feel the character's pain. 49.3% could agree with the description. 27.4% did not agree or disagree. 49.3% disagreed and 9.6 % of the participants strongly disagreed indicating that they could not feel the character's pain. The greater the extent of agreement, the greater the extent of empathy felt by the respondent towards the character.

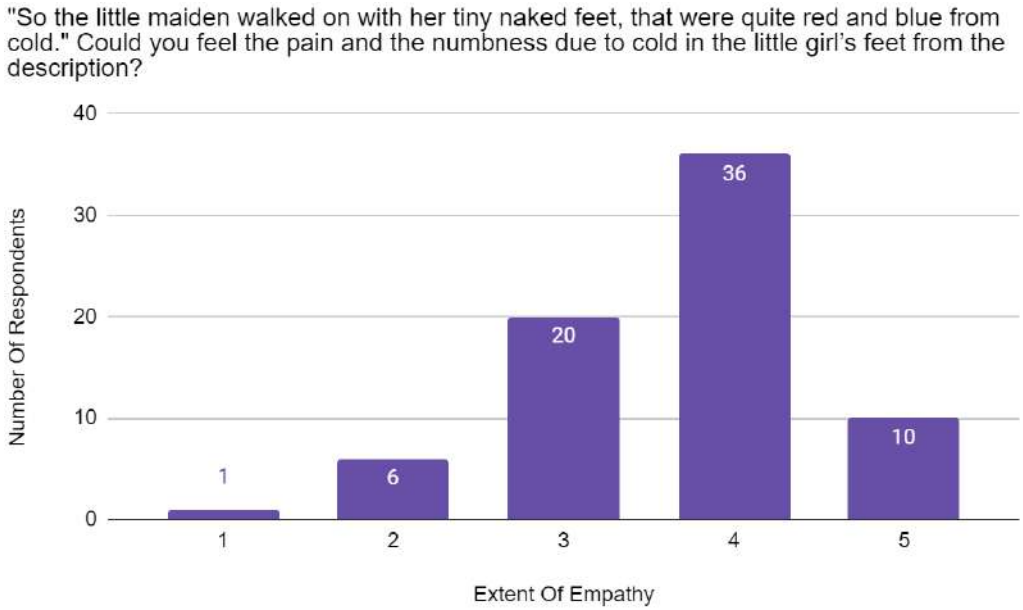

Fig. 3. The bar graph represents the extent of empathy felt by the respondents towards the little maiden. The number of respondents is represented on the y-axis and the extent of empathy is on the x-axis.

Period of Identification

The results of this section indicate whether the personality of fictional characters can influence readers. 38.4% strongly agreed that the character leaves a mark of their personality on them for a period. 31.5% agreed to this statement.17.8% neither agreed nor disagreed. 12.3% disagreed, but no participant strongly disagreed with this statement.

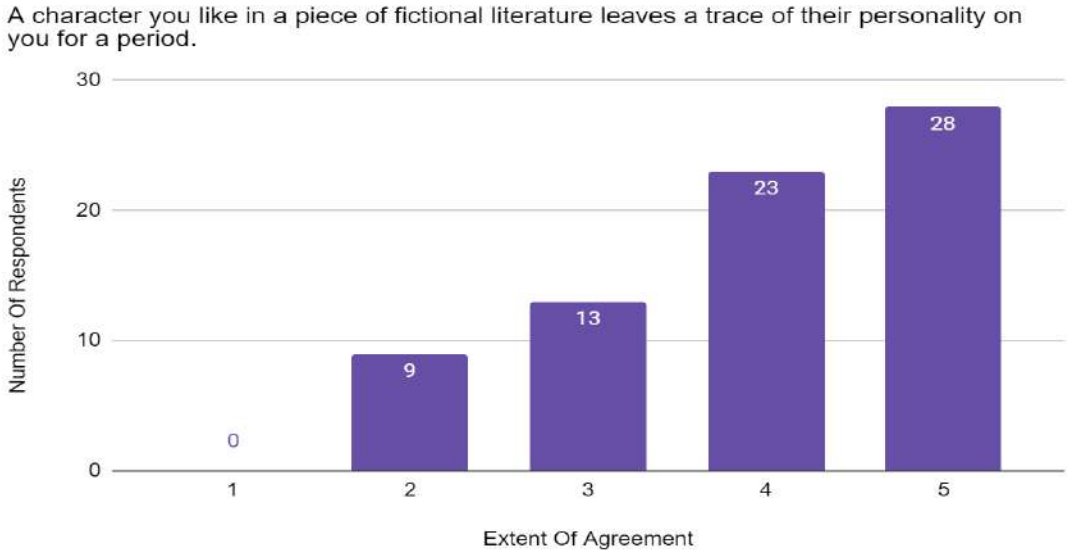

Fig. 4. The bar graph represents the extent of agreement to the statement in question: The number of respondents is represented on the y-axis and the extent of agreement on the x-axis.

Extent of identification

The results under this section indicate the extent to which readers identify with their favorite character. 50.7% of participants strongly agreed that they imagined themselves in place of the character and experienced the events in the story. 32.9% of participants agreed with the statement. 8.2% made a neutral choice. A few 8.2 % of participants disagreed that they do not experience the events in the story. The greater the extent of agreement, the greater is the extent of identification.

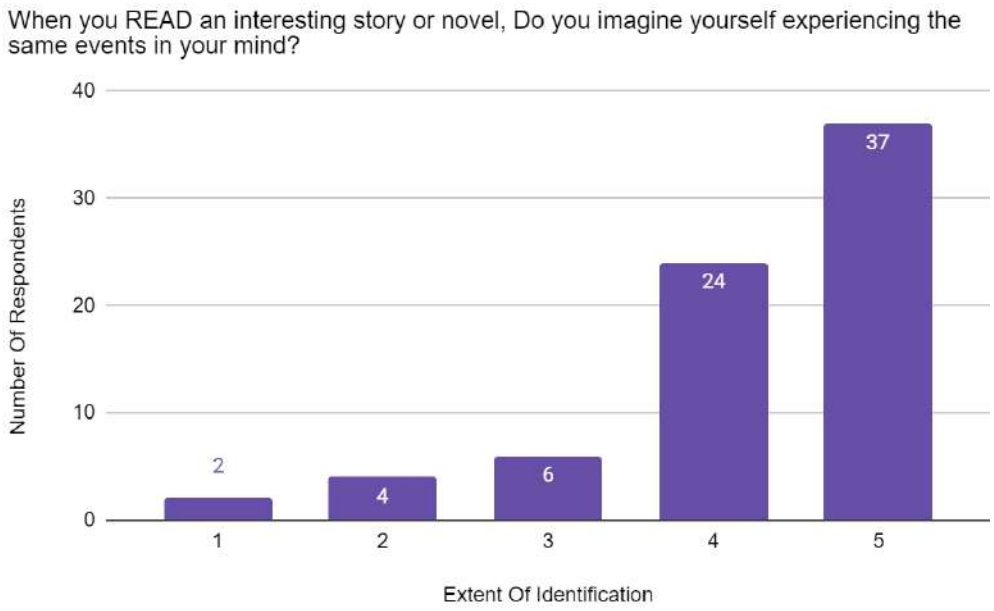

Fig. 5. The bar graph represents the extent of identification felt by the respondents towards a character. The number of respondents is represented on the y-axis and the extent of identification is on the x-axis.

Discussion

Trait identification is the tendency to get immersed in the experiences of a fictional character during the narrative engagement. It functionally associates to the volume of the left hippocampus, with the cortical thickness (CT) in the left dorsal medial prefrontal cortex (ldMPFC) and the right anterior insula (rAI), and with the volume of grey matter in the left and right dorsolateral prefrontal cortex (rDLPFC). Individuals who regularly engage in narrative fiction and stimulate these areas of the brain have greater self-other neural overlap.

The left hippocampus is thought to play an important role in constructing complex imaginary scenes. Activation of the hippocampus is needed to project into and situate oneself in a visualized imaginary scene. The greater the details to be processed, the greater is the stimulation of the hippocampus (Cheetham, Hänggi, & Jancke, 2014).

A study by Mar et al.(2006) has linked reading fictional literature to greater empathy. This may be due to the ability of fictional literature to provide access to the characters' thoughts and

feelings while mentally transporting the reader to a fictional world. Imitating a trait of a liked character from a piece of fictional literature can be explained by the phenomenon "experience taking". In "experience taking" the reader becomes the character they relate to and imitates the traits, feelings, targets, actions, and thoughts of the character (Kaufman & Libby, 2012; Oatley, 1995). However, reading in a setting that reminds the reader of their self-identity, such as in front of a mirror, can obstruct "experience taking" from occurring which may explain why 12.3% could not identify with a character (Kaufman & Libby, 2012).

Some conditions cause people to excessively indulge in a fictional world. Maladaptive daydreaming is experienced by people addicted to daydreaming that it can replace real-life human interactions and prevent normal functioning which can lead to any form of emotional distress (Somer, 2002). Maladaptive daydreamers usually daydream about a fictional world with fictional characters and can spend 60% of their awake time daydreaming (Somer, Lehrfeld, Bigelsen & Jopp, 2016). A neurological condition called "*mirror-touch synesthesia*" causes people to experience touch, pain, and other sensations when they watch, read or hear people experiencing the same. Research has claimed that mirror-touch synesthetes have greater empathy than people who do not have the condition which may be due to a hyperactive empathy mechanism present in synesthetes (Banissy & Ward, 2007).

Paracosm is another condition developed from childhood in which a detailed imaginary world is constructed that may be based on fictional worlds in books or films and can be maintained for years (MacKeith, 1984). Overidentification with fictional characters can also have negative impacts as it has been shown to cause self-delusion which may support and reinforce an unrealistic self-narrative (Mathies, 2019).

Conclusion

This study used a simple approach to identify and understand the effect of fictional characters on individuals. Based on the findings, it can be concluded that fictional characters influence individuals in real life. The characters were shown to cause changes in the individual's personality, decisions, and moral values. Results from section one indicated that most of the participants were positively influenced by their favorite fictional character, identified with them, and imitated traits of the character. Results from section two showed that a significant number of the participants could visualize the story and were empathetic towards the protagonist of the short story. Additionally, most of the readers were tolerant towards controversial views in fictional literature and could identify with their favorite characters. The influence of a character's personality on the reader can last for a while after reading the fictional piece of literature. However, excessive indulgence in fictional worlds may be due to psychological or neurological conditions such as maladaptive daydreaming, paracosm, mirror-touch synesthesia, etc.

This study has a few limitations. It was conducted on a group of individuals whose ages varied from 13 to 34 out of which 65.8% were females and 34.2% were males which caused gender

bias. About 86.3% of participants were in the age group of 18-25 so the results may not apply to other age groups. Some respondents did not have English as their primary language and some of the subjective responses obtained were ambiguous. The genre to which the fictional characters belonged was not standardized. Hence, these factors may have affected the results of the study. Future studies can include fMRI to acquire brain images while volunteers perform tasks to obtain accurate results. Tasks such as the Frith-Happé animation task (White et al., 2011) to assess social cognition, Author Recognition Test(Mar and Rain, 2015) to indicate reading habits, Reading the Mind in the Eyes Test (Baron-Cohen et al., 2001) to measure emotion recognition, etc. can be used in future investigations for detailed results.

Limitation of the study

The study is solely based on the reliance of the participant's responses to a questionnaire, and it is without appropriate technology or neuro-medical instruments and identifiers. The study is only done to understand a sociological implication from a neuroscience perspective and eliminates the qualitative aspects of the study.

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Conflict Of Interest:

The authors of this article declare that they have no conflict of interest concerning the authorship of this paper.

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