Types of Narrative Writing and Reading to Contrast Emotional Stress After Trauma and PTSD

Toni Marino, Vittoria Serafini

Abstract • This paper aims to improve knowledge regarding the use of narrative texts in the treatment of people with trauma and suffering from PTSD. To achieve this goal, results from narrative persuasion studies, with reference to research on transportation (involvement with the storyline: feeling of being lost in the story) and identification (allegiance with characters) were used. This paper proposes the results of two experimental studies. The main objective of both studies was to increase the knowledge concerning narrative prototypes that have turned out to be effective in the treatment of people afflicted with traumatic and post-traumatic syndrome. The first study analyzes the role played by the narrative reconstruction of traumatic events by traumatized subjects as a tool for reducing stress levels and provides an analysis of the narrative and linguistic structures used in the narrative reconstruction of traumatic events. The second study, on the other hand, examines above all the role of reading narrative texts as a tool to mitigate stress levels and tries to establish what role perceived realism and the type of narrator play on the narrative transport of readers.

Keywords • Trauma narrative; Narrative medicine; Narrative persuasion; Narrative transportation; Realism.

Ledizioni⊠◼⊠

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1. Study 1

1.1 Hypotheses and research questions

This study aims to validate the following scientific hypothesis: (H_1) When people with trauma write stories about the events that traumatized them, the emotional stress generated by the trauma subsides. This is a topic dealt with specifically in the field of psychological studies where, for a long time, the practice of narrative re-elaboration of traumatic memory has been valued. This topic, however, has evident relations with both classical and cognitive narratology studies, because the tool that determines the re-elaboration process is a narrative text.[1] To establish a relationship between narrative text and emotional memory, it is therefore appropriate to increase the level of knowledge of narrative texts as cognitive tools, and to try to establish the type of relationship that exists between some specific narrative structures, both profound (narrator, focuses and narrative syntax) and surface (lexicon and style figures) and the emotional reaction of the subjects, both when they produce these texts, as in the case of traumatized subjects, and when it comes to readers who use the narrative text as a tool for emotional growth.[2]

We believe that, considering the content of the traumatic narrative the only component that determines stress levels and believing that grammatic narrative has no effect, is incorrect.[3] If this is proved in the case of traumatized subjects, where the traumatic event is therefore real, it does not necessarily apply to non-traumatized subjects who come into contact with the traumas only on the level of narrative fiction or in a more detached and less involved (e.g. caregivers or people who exercise care to have empathy towards traumatized subjects) or even just the need to use empathy as a tool to raise public awareness

[1] Kitty Klein, *Narrative Construction, Cognitive Processing and Health*, in *Narrative Theory and The Cognitive Sciences*, ed. by David Herman, Stanford, CSLI Publications, 2003, pp. 56-84; Stephen J. Lepore, Melanie A. Greenberg, *Mending Broken Hearts: Effects of Expressive Writing on Mood, Cognitive Processing, Social Adjustment and Health Following a Relationship Breakup*, «Psychology and Health», 17, 2002, pp. 547-560 ; Lepore, *Expressive Writing Moderates the Relation Between Intrusive Thoughts and Depressive Symptoms*, «Journal of Personality and Social Psychology», 73, 1997, pp. 1030-1037; Laura A. King, Kathi N. Miner, *Writing About the Perceived Benefits of Traumatic Events: Implications for Physical Health*, «Personality and Social Psychological Bulletin», 26, 2000, pp. 220-230; Nancy K. Westerman, Vanessa E. Cobham, *Brett McDermott, Trauma-Focused Cognitive Behavior Therapy: Narratives of Children and Adolescents*, «Qualitative Health Research», 27, 2, 2017, pp. 226-235.
[2] Marcus Appel, Tobias Richter, *Persuasive Effects of Fictional Narratives Increase Over Time*, «Media Psychology», 10, 2007, pp. 113-134; Helena Bilandzic, Rick Busselle, *Narrative Persuasion*, *The SAGE Handbook of Persuasion: Developments in Theory and Practice*, ed. by James Price Dillard, Lijiang Shen, Thousand Oaks, SAGE Publications Inc., 2012, pp. 200-219.
[3] Jeff Jaeger, Katie M. Lindblom, Kelly Parker-Guilbert, Lori A. Zoellner, *Trauma Narratives: It's What You Say, Not How You Say It*, «Psychol Trauma», 5, 2014, pp. 473-481.

of the material and emotional needs of traumatized subjects. For this reason, this study also answers the research question: (RQ₁) What are the recurring narrative structures in the stories of traumatized people?

Due to their importance, some basic narrative features have been observed: configuration of the narrative instance and focalizations.[4] Subsequently, a linguistic analysis was carried out on the corpus of collected stories.

Specifically, to answer this question a qualitative analysis of the narrative reconstructions of the trauma provided by the participants of group A was carried out. Furthermore, a comparative analysis between the narrative reconstructions of the traumatized people and that of the non-traumatized people was carried out. In the two analyzes, both a general observation of the narrative structures was carried out, with reference to the way in which the narrative instance is organized (narrator) and the mimetic strategies adopted (subjective vs objective),[5] and a linguistic analysis.

1.2 Design and procedure

The first study aims to explore the impact of narrative writing on emotion and PTSD symptoms related to a trauma or a state of high stress. This study is a 2X2 experimental design in between mode. Two links connected to modules powered by Google were distributed within the same statistical population. The first link involved the sequential administration of:
- a Covid 19 Exposure Scale to detect the level of traumatization due to Covid 19 pandemic.
- a request for a written story about the period of spread of the virus or about the trauma due to Covid 19 pandemic.
- a Trauma Symptoms checklist 40 (TSC-40) which evaluates the symptoms associated with traumatic events.

The second link only involved the administration of the Covid 19 Exposure scale and TSC- 40 but excluding the narrative treatment. Those who filled out the second link, therefore, did not elaborate a story but they were asked to remember, for a very short time, the period of maximum diffusion of Covid 19 and their emotions and feelings related to it. According to the conditions "presence of trauma" / "absence of trauma", two groups were identified ex post through the Covid 19 Exposure Scale. Each group was randomly assigned to a narrative treatment: writing the story of a trauma experience related to Covid 19 or just remembering the period of the pandemic (see Fig. 1). For the experimental protocol we followed the basic indications of Bortolussi & Dixon.[6]

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[4] Katheryn R. Christy, *I, You, or He: Examining the Impact of Point of View on Narrative Persuasion*, «Media Psychology», 21, 4, 2018, pp. 700-718.

[5] From a semiotic point of view, to construct an illusion of objectivity in a written text, it is necessary to remove the enunciator's signs, the space-time deictics, and use further linguistic strategies. to construct an illusion of a realism which is the reconstruction of a scene according to a precise point of view, however, it is necessary to maintain these signs, that is to emphasize the lens through which the facts are observed.

[6] Marisa Bortolussi, Peter Dixon, *Psychonarratology. Foundations for the Empirical Study of Literary Response*, Cambridge, Cambridge University Press, 2002.

Narrative condition	*Writing a trauma story*	*Remembering a trauma*
Traumatic condition		
Presence of Trauma	TSC-40 SCORE	TSC-40 SCORE
Absence of Trauma	TSC-40 SCORE	TSC-40 SCORE

Fig. 1 Study 1 design

1.2.1 Measures

Study 1 uses a Covid-19 exposure scale to identify the subgroup of virtually traumatized people and a TSC-40 (Trauma Symptom Checklist 40 item) to measure the stress level of the people involved.

Covid-19 exposure scale
The covid 19 exposure scale is a tool developed by the National Center for PTSD, Department of Veterans Affairs. This scale is a 28-item self-report measure designed to assess potentially traumatic exposures related to the COVID-19 (coronavirus) pandemic. This scale was validated in 2021 but was used after its literal translation into Italian. Even if the validation process has been formally compromised, in fact the scale used has preserved, in structure and substance, its analytical potential, not having detected at the time of translation any cultural conflict between the original and the Italian context in which the translated version has been implemented. This scale is designed to be used in research and it was created to assess types of potentially traumatic exposure research participants may have had in relation to the COVID-19 pandemic. This scale can be scored cumulatively (e.g., summing the number of "Yes" responses, range: 0-28), or individual items can be used independently to characterize specific types of exposure to COVID-19 stressors.

The scale is structured in 5 parts: Part A asks respondents to declare whether they have contracted the virus, if a cohabiting family member (or a non-member of the family) has contracted the virus, or if a non-family member who is not cohabiting, but close to the 'interviewee, has contracted the virus. Sections B, C, D ask to specify, for each of these cases, the level of the disease developed and to deepen the description of the symptoms (pathological consequences, possible hospitalization and survival risk). Section E asks questions about the level of contact with the virus in the workplace.

TSC-40
TSC-40 is a psychological scale elaborated by John Briere, and Marsha Runtz.[7] The TSC-40 is a research measure that evaluates symptomatology in adults associated with childhood or adult traumatic experiences. It measures aspects of post-traumatic stress and other symptom clusters found in some traumatized individuals. It does not measure all 17 criteria of PTSD and should not be used as a complete measure of that construct. The TSC-40 is a revision of the earlier TSC-33.

The TSC-40 is a 40-item self-report instrument consisting of six subscales: Anxiety, Depression, Dissociation, Sexual Abuse Trauma Index (SATI), Sexual Problems, and Sleep Disturbance, as well as a total score. Each symptom item is rated according to its frequency of occurrence over the prior two months, using a four-point scale ranging from 0 ("never") to 3 ("often"). The TSC-40 is a research measure, not a clinical test.

An Italian translation of this scale was used to measure the stress level of the participants at the study 1 by means of a form powered by Google. During translation, all items that

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[7] John Briere, Marsha Runtz, *The Trauma Symptom Checklist (TSC-33): Early data on a new scale*, «Journal of Interpersonal Violence», 4, 1989, pp. 151-163.

explicitly referred to the sexual sphere were eliminated because the level of security for the protection of privacy guaranteed by Google was deemed incompatible with the level of security required by European legislation on data processing.

In the study, TSC-40 was used solely as a comparative analysis tool to compare the scores obtained by the two experimental groups who had different narrative treatment.

1.2.2 Participants

The study 1 involved 52 randomly selected people (M. 19 F. 33) with the age of 18-25 (15), 26-45 (25) and 46-65 (12). The 70% of the participants have a higher education level (Laurea degree or Master's degree) and a percentage of the sample (15) stated that they have a profession in which they usually take care of other people.

For the identification of the two subgroups to be compared we used results of the Covid-19 exposure scale. Questions 1 and 2 of section A were evaluated, in which the interviewees declared that they had contracted the virus or that they had had a family member and / or cohabitant who had contracted the virus. If the answer to these questions was affirmative, the answers were placed in the subgroup of virtually traumatized people while if the answer was negative the answers were placed in the subgroup of non-traumatized people. This arbitrary choice was necessary for two reasons: (i) the level of parental bond and / or cohabitation directly affect (emotionally and materially) the level of relationship with the person who responded and therefore on the perception of the related risks as consequences of the infection; (ii) the study was administered in the first half of 2022 when the perception of risk had already strongly decreased and the responses to the items concerning feelings of worry and fear appeared to be compromised. In this regard, we already anticipate in this paragraph that the covid 19 exposure scale was administered in section I of the study, before stimulating the memory of the trauma in the interviewees. From the application of the two criteria, two subgroups were identified: the group of participants susceptible to post-traumatic stress trauma that narratively reconstructed the trauma (14 participants M. 4 F. 10, of which 7 responded positively to both the first and second questions of section A of the covid-19 exposure scale) and the subgroup of participants susceptible to post-traumatic stress trauma that did not narratively reconstruct the trauma (16 participants M. 11, F. 5, of which 6 responded positively to both the first and second questions of section A of the covid-19 exposure scale).

1.2.3 Stimulus materials and messages

In study 1 no stimulus materials were used, and no messages were read. The only information provided to the participants before starting the test, by means of verbal introductions placed in the 3 sections of the form powered by google, concerned the scientific purposes of the research (it was said that the research had as its topic the emotional study of the subjects during the covid-19 pandemic) and reassurances about anonymity. The only more detailed information was given to the participants of group A when they were asked to tell in writing a specific experience related to the covid-19 pandemic. In this case, the information provided was aimed at not binding the participants and leaving them free to choose a story of an episode that had particularly affected them, not necessarily dysphoric. The only indirect constraint was given by providing a title to the section that included the use of a possessive adjective "my story" which referred to a direct involvement of the narrator. In this way it was suggested to the participants to provide narrative testimony from a personal perspective and not connected to current opinions. We do not believe that this indication has influenced the choice of a homodiegetic narrator or, more generally, of a story in the first person.

1.3 Results

1.3.1 Verification of H1

To verify the hypothesis, we made two comparisons between the two subgroups identified: (i) comparison between the total scores obtained on TSC-40 and (ii) comparison with ANOVA at one factor between the arithmetic means of the single items of TSC-40. In addition, based on the observation of descriptive statistical data relating to the single items of TSC-40, comparisons were attempted (with the one-factor ANOVA test) on single items for which the confirmation of H_1 with a null hypothesis test was plausible. From the comparisons H_1 is not verified. Therefore, the second hypothesis that a narrative reworking of a traumatic memory can favor a decrease in emotional stress resulting from the same trauma has been formally contradicted. From the comparison of the total scores, the subgroup that underwent the narrative treatment reported higher scores than the TSC-40 of the subgroup that did not narratively elaborate the memory (total score subgroup 1 "432" vs total score subgroup 2 "346 ").

The data of the ANOVA test, comparing the means reported in each item by the participants in the two groups, show a p-value equal to 0.72. Moreover, already from the observation of descriptive statistics data, the confirmation of H_0 with respect to H_1 appeared plausible.

The inferential calculations on individual items reported only one confirmation result of H_1, relating to the item "fear of isolation" (Fig. 2) for which the p-value was 0.05. Even the item "sadness", which has two distant arithmetic means, confirmed the hypothesis H_0 reporting a p-value of 0.11, just above the acceptable error threshold of 5%.

During the check on the interaction of the demographic variables, however, the gender of the interviewees was found to be a confounding variable. The total score at TSC-40 of female participants was 517, against the male one equal to 257. For the comparison with the one-factor ANOVA method, on the other hand, we created two different gender groups made up of the participants who had totaled the score greater, stratified by gender to have 10 females and 10 males. From the results of the ANOVA test (Fig. 3) the difference in the answers is confirmed (p-value = 0.00) and the total score of the means in the female participants is higher (F. 44.9; M. 24). Therefore, from the study, it clearly emerges that the state of emotional stress associated with the trauma of the pandemic is conditioned by gender, being greater in the female gender regardless of the narrative treatment.

RIEPILOGO

Gruppi	Conteggio	Somma	Media	Varianza
Sentirsi isolati rispetto agli altri (G1)	14	28	2	1,23076923
Sentirsi isolati rispetto agli altri (G2)	16	19	1,1875	1,22916667

ANALISI VARIANZA

Origine della variazione	SQ	gdl	MQ	F	Valore di significatività	F crit
Tra gruppi	4,92916667	1	4,92916667	4,0077435	**0,055064902**	4,195971819
In gruppi	34,4375	28	1,22991071			
Totale	39,3666667	29				

Fig. 2 ANOVA item "fear of isolation"

RIEPILOGO				
Gruppi	*Conteggio*	*Somma*	*Media*	*Varianza*
TSC-40 M	32	24	0,75	0,31870968
TSC_40 F	32	44,9	1,403125	0,52611895

ANALISI VARIANZA						
Origine della variazione	*SQ*	*gdl*	*MQ*	*F*	*Valore di significatività*	*F crit*
						3,9958871
Tra gruppi	6,82515625	1	6,82515625	16,1574928	**0,000160437**	3
In gruppi	26,1896875	62	0,42241431			

Fig. 3 ANOVA F vs M

1.3.2 Comparative narratological and linguistic analysis for RQ$_1$

From the comparative narratological analysis, no differences emerged in the way of setting up the stories: the participants who declared a direct or immediate contagion behaved in the same way of those who did not declare contagions. The stylistic structure of the stories is strongly oriented towards face-to-face storytelling, that is, it does not present stylistic features belonging to standardized narrative genres but is very similar to a colloquial narration between friends.

From a structural point of view, the following elements recur almost completely (except for three cases):
- intradiegetic and homodiegetic narrator, with an omniscient or close to omniscience cognitive level.
- the narrative instance is often dramatized (profession, age, underlying values are described) and the present transparency strategies give to the reader a perceptual, cognitive and emotional access to the narrator's mind.
- strict focalization that emphasizes the narrator's point of view.
- the mimetic strategy is of a "subjective" type: the enunciation marks are present, the space-time deictics are present; examples are provided as evidence (to support one's point of view).

The emotional tone of the stories, as expected, is of a dysphoric type. Although the forms were compiled in 2022 and the events reported generally date back to the first period of spread of the virus, the dysphoric tone is strongly present. In most cases, the narrative is immersed from the very beginning in a context with a negative emotional value. Even in the few cases in which the memory of a pre-covid state with a positive emotional value is recalled, the quantification of the recall is so low that it does not trigger forms of emotional shift.[8]

The linguistic-computation analysis, carried out with the T-LAB software, established that all the participants, both those who reported a direct or immediate contagion, and those who did not report it, dedicated a similar number of words to the stories of their own experience (total of words per group: about 2500). The top 10 most used words, leaving out articles, conjunctions, and auxiliary verbs, are: pandemia (27), covid (24), casa (19), paura

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[8] Nizia Alam, Jiyeon So, *Contributions of emotional flow in narrative persuasion: An empirical test of the emotional flow framework*, «Communication Quarterly», 68, 2, 2020, pp. 161-182.

(18), persone (17), ricordo (17), due (16), anni (15), vita (15). These are words that are not necessarily dysphoric, but which appear as such in the phrasal or period network in which they are inserted (Fig. 4). The first 10 combinations of three words, on the other hand, turn out: della mia vita (4), persone a me (4), a me care (3), che mi ha (3), con gli altri (3), dei miei cari (3), due anni di (3), il covid ha (3), il giorno dopo (3), la pandemia ha (3). Most of these are noun phrases that translate deep existential structures (life, affects, temporality) and verbal phrases that see the virus as the agent (Fig. 5 and 6). Considering what emerged from the study relating to H_1, considering that 80% of the sample from which the two comparison groups were extracted is female, what emerges from the study is that the narratological and computational linguistics data relating to trauma narratives presented are more likely to be ascribed to the female universe.
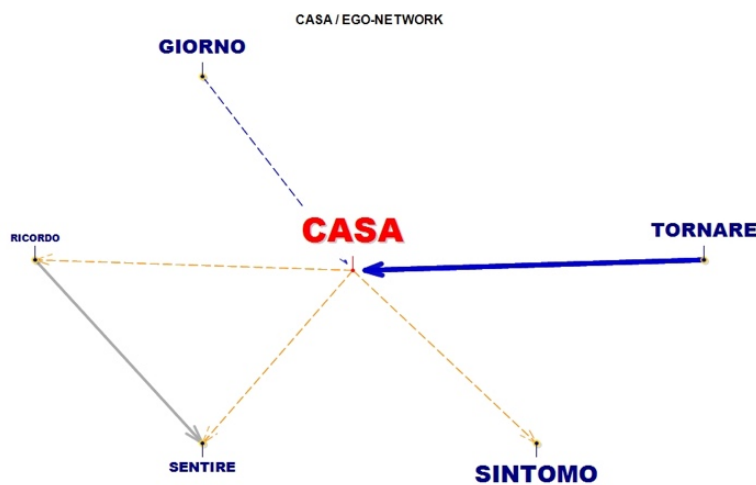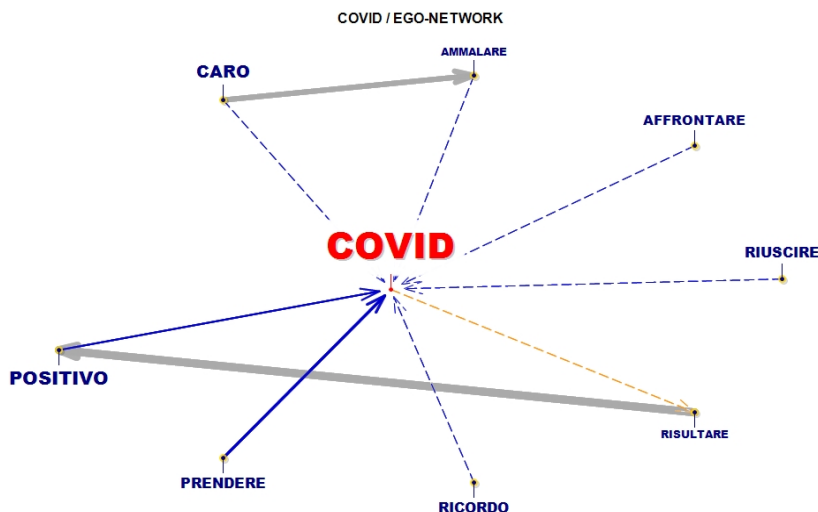

Fig. 4 Word-Network: Casa
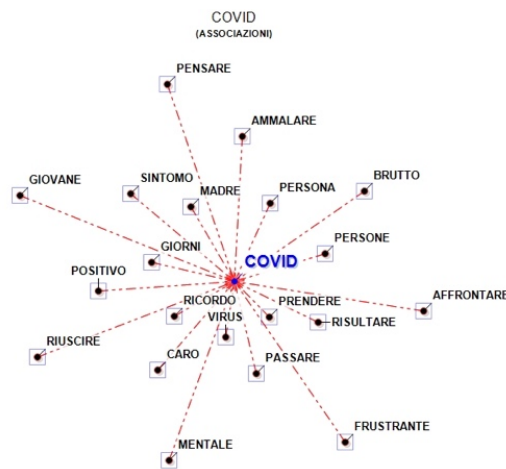

Fig. 5 Word-Network: Covid

Fig. 6 Word-Associations: Covid

1.4 Discussion

The main element to be discussed is certainly the lack of validation of H_1: narrative elaboration of trauma did not predict a low emotional stress level. This is a fact that contradicts many experimental studies conducted in the psychological field on traumatized patients or patients with post-traumatic syndrome. Moreover, the data contradicts a methodology long acquired in the psychological field (narrative account of the patient) but also widespread in the context of narrative medicine.[9] In our opinion, there are two reasons for this non-validation. The first, most of the studies conducted in the psychological or narrative medicine field report cases relating to diagnosed traumatic and post-traumatic forms. In our case, however, we used a questionnaire that did not necessarily intercept cases of traumatic or post traumatic syndrome. The second, compiling a narrative account of a trauma or situation that has affected a person emotionally requires stronger motivation and solicitation than we could count on with a form powered by google. In this regard, we remind you that we did not have a budget available to support the experiment and therefore also to offer a reward to the participants. In any case, after reading the results of the study, we believe that the request to produce a written text is more suitable for a design that involves the direct interaction of researchers with the participants.

2. Study 2

2.1 Hypotheses and research questions

Some scholars[10] have stressed the importance of storytelling in the healthcare context and more generally as a tool for changing the attitudes of subjects. It is necessary to know the

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[9] See "Parallel chart" by Rita Charon, in Ead., *Narrative Medicine: Attention, Representation, Affiliation*, «Narrative», 13, 3, 2005, pp. 261-270.

[10] Meng Chen, Robert A. Bell, Laramie D. Taylor, *Persuasive Effects of Point of View, Protagonist Competence, and Similarity in a Health Narrative about Type 2 Diabetes*, «Journal of Health

transport mechanisms that the narration can induce and the degree of identification of the reader with the protagonist of a story to take advantage of the persuasive potential of the narration, in medicine as in others with social texts, and to be able to modify people's habits, their behaviors and their beliefs.[11]

Knowledge of narrative-based persuasion involves the study of two fundamental categories: narrative transport and identification. By narrative transport we refer to the ability of a story to involve the reader. Scientific evidence and various narratological studies have shown that narratives can be much more persuasive than non-narrative formats.[12] Melanie Green and Timothy Brock[13] devised a specific model for the quantification of narrative persuasion: the Transportation-Imagery Model. According to Green and Brock, during the transport phase all the cognitive faculties of the subject are focused on what is happening in the narrative. To measure the degree of narrative transport of a reader, there are items, connected to a Likert scale, which ask the reader / viewer / listener for her/his level of involvement during the use of a story. Narrative identification is the process of emotional and cognitive alignment of the reader with a specific character in the narrative. Green and Brock argue that identification is a process in which the reader experiences a gradual loss of self-awareness, temporarily aligning his own self with that of the story's protagonist, both cognitively and emotionally. As the reader conforms to the character, she/he adopts her/his perspective and her goals. To empirically detect the level of identification there are validated measurement scales.

With transport and identification, it is possible to influence people's attitudes, beliefs, and behaviors. Based on the emotional variables that are used in the narration, consequent responses are obtained in terms of changing attitudes and judgments. According to a study conducted by Hoeks, Jansen and Ooms,[14] fear, sadness, surprise and compassion are the emotions to focus on in order to manipulate a text to increase transport. On the other hand, it is recommended to focus on compassion to stimulate the process of identification.

Communication», 22, 2017, pp. 702-712; Rashmi Adaval, Robert S. Wyer, *The Role of Narrative in Consumer Information Processing*, «Journal of Consumer Psychology», 7, 1998, pp. 207-245; Hyunyi Cho, Franklin. J. Boster, *First and Third Person Perceptions on Anti-Drug Ads among Adolescents*, «Communication Research», 35, 2008, pp. 169-189; Susan Morgan, Lauren E. Movius, Michael Cody, *The Power of Narratives: The Effect of Organ Donation Entertainment Television Storylines on the Attitudes, Knowledge, and Behaviors of Donors and Non-Donors*, «Journal of Communication», 59, 2009, pp. 135-151.

[11] Melanie C. Green, *Transportation Into Narrative Worlds: The Role of Prior Knowledge and Perceived Realism*, «Discourse Processes: A Multidisciplinary Journal», 38, 2004, 247-266; Green, *Research Challenges: Research Challenges in Narrative Persuasion*, «Information Design Journal», 16, 2008, pp. 47-52; Green, Timothy Brock, *The Role of Transportation in the Persuasiveness of Public Narratives*, «Journal of Personality and Social Psychology», 79, 2000, pp. 701-721; Timon Gebbers, John B. De Wit, Markus Appel, *Transportation into Narrative Worlds and the Motivation to change Health-Related Behavior*, «International Journal of Communication», 11, 2017, pp. 4886-4906; Appel, Tobias Richter, *Transportation and Need for Affect in Narrative Persuasion: A Mediated Moderation Model*, «Media Psychology», 13, 2010, pp. 101-135.

[12] Appel *et al.*, *Empowering Stories: Transportation Into Narratives With Strong Protagonists Increases Self-Related Control Beliefs*, «Discourse Processes», 56, 8, 2019, pp. 575-598.

[13] Green, Brock, *In the Mind's Eye: Transportation-Imagery Model of Narrative Persuasion*, in Green, Jeffrey J. Strange, Brock (Eds.), *Narrative Impact: Social and Cognitive Foundations*, Mahwah, NJ: Erlbaum, 2002, pp. 315-341.

[14] John Hoeks, Carel Jansen, Joelle Ooms, *"Hey, that could be me": The role of Similarity in Narrative Persuasion*, «PLoS ONE», 14, 4, 2019, pp. 1-18.

A further element that can stimulate the transport and change of attitudes in people is perceived realism. Perceived realism refers to various factors that contribute to make a story perceive as real. Cho, Shen and Wilson,[15] taking up the studies of Hall[16] identify five dimensions that determine the perception of realism of a story: plausibility, typicality, factuality, narrative consistency, perceptual quality. For each of them they have built a list of essential elements that contribute to realizing the perception of realism. Furthermore, they related each of the five factors of realism with the three processes of narrative transport (identification, emotional involvement, message evaluation), and the latter with the change of attitudes. In their study it is stated, for example, that perceptual quality predicts emotional involvement rather than other forms of transport, and thus, for each factor, a specific relationship with narrative transport is established.

Our second study empirically tested theoretical postulation regarding the persuasive effects of transportation and identification induced by narrative messages. The main goal of this study is to test the possibility of manipulating states of belief and behavior of people through the reading of narrative texts with specific structural features and written in a way that suggests a perception of realism. The study aims to confirm the following scientific hypothesis: (H_1) reading narrative texts decreases the emotional stress generated by trauma. Furthermore, the study evaluates the narrative variables involved in the treatment of traumatized people, answering the following research question: (RQ_1) narrative variables that have proven effective in engaging common readers, such as direct narrative instance,[17] emotional shift[18] and perceived realism,[19] can they play a role in the care of patients with the PTSD?

2.2 Design and procedure

This study is a 2X3 experimental design in between mode. Also in this case, three links powered by Google have been circulated. The first link involved the administration, in sequence, of:
- a predictive test of post traumatic syndrome (PTSD Checklist).
- a story to read, characterized by the following narrative features: (1) intradiegetic and homodiegetic narrator coinciding with the protagonist who narrates the events of his own life; (2) emotional shift from negative to positive valence; (3) strategy to induce the perception of realism in the reader.
- a TSC-40 to measure the effects of reading on post traumatic symptoms.

The second link, on the other hand, provided for the administration of:
- a predictive test of post traumatic syndrome (PTSD Checklist).

[15] Hyunyi Cho, Lijiang Shen, Kari Wilson, *Perceived Realism: Dimensions and Roles in Narrative Persuasion*, «Communication Research», 41, 6, 2014, pp. 828-851.

[16] Alice Hall, *Reading Realism: Audiences' Evaluations of the Reality of Media Texts*, «Journal of Communication», 53, 2003, pp. 624-641.

[17] Lynn Gumb Lynn, *Trauma and Recovery: Finding the Ordinary Hero in Fictional Recovery Narratives*, «Journal of Humanistic Psychology», 58, 4, 2018, pp. 460-474; Melissa J. Robinson, Silvia Knobloch-Westerwick, *Bedtime Stories that Work: The Effect of Protagonist Liking on Narrative Persuasion*, «Health Communication», 32, 3, 2017, pp. 339-346.

[18] Green, Robin L. Nabi, *The Role of a Narrative's Emotional Flow in Promoting Persuasive Outcomes*, «Media Psychology», 18, 2015, pp. 137-162.

[19] Hyunyi Cho, Lijiang Shen, Kari Wilson, *Perceived Realism: Dimensions and Roles in Narrative Persuasion*, «Communication Research», 41, 6, 2014, pp. 828-851.

- a story to read, characterized by the following narrative features: (1) extra-die-getic and homodiegetic narrator, coinciding with a reflector character involved in the story; (2) absence of emotional shift and use of the positive valence only; (3) strategy to induce in the reader the perception of the story as not real but invented.
- a TSC-40 to measure the effects of reading on post traumatic symptoms.

Finally, the third link provided for the administration of the PTSD Checklist and TSC-40, without the presence of the narrative reading condition. The experimental setting was the same as in Study 1. The PTSD Checklist provides information on the level of emotional distress of the participants, indicating whether they are in a post-traumatic stress condition or no. Each of them, by chance, were assigned to a different narrative treatment: reading of story 1, reading of story 2, or absence of reading. at the end each of them compiles a TSC-40 checklist to verify if the initial emotional stress level has decreased, increased or remained stable (Fig. 7).

Narrative condition	Reading story 1	Reading story 2	Absence of reading
PTSD condition			
Presence of PTSD	TSC-40 SCORE	TSC-40 SCORE	TSC-40 SCORE
Absence of PTSD	TSC-40 SCORE	TSC-40 SCORE	TSC-40 SCORE

Fig. 7 Study 2 design

The second study was first administered via links to modules powered by Google and then was administered to the patients of the Spinal Unit of the Perugia Hospital, with the help of the psychologist and social worker. The interactions of the results with the demographic variables were always checked. For the experimental protocol we followed the basic indications of Bortolussi & Dixon.[20]

2.2.1 Measures

PTSD Checklist PCL-C
The PTSD Checklist, Civilian Version (PCL-C) was developed by Frank Weathers and his colleagues at the National Center for PTSD (1993). The scale consists of 17 questions that now correspond to DSM-IV. It is a list of problems and complaints that people sometimes have in response to stressful life experiences. Respondents are asked how often they have been bothered by each symptom is the past month on a 5-point severity scale. According to the authors, the questions may be worded generically to refer to "stressful experiences in the past" (PCL-C) or to describe reactions to a specific event (PCL-S). Initial psychometric data was derived by using a military version of the PCL (PCL-M) in a sample of Vietnam veterans, in which the prevalence of PTSD was high. The scale has been translated into Italian from English.

TSC-40
See study 1

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[20] See footnote 6.

2.2.2 Participants

The study 1 involved 35 randomly selected university students (M. 8 F. 27) aged, predominantly, 18-35. Some students (23) said they had suffered physical or psychological trauma in their lifetime. Participants were randomly assigned to one of three conditions.

The participants of the spinal unit of the Perugia hospital were given 3 separate forms powered by google but structured in the same way. This part of study 2 involved 22 people (M. 10 F. 12) who were patients of the spinal unit, health workers (doctors, nurses) working in the spinal unit, or caregivers. In this part of the study, the control group was not used but the experiment was organized as a sort of A / B test to assess whether there are differences in emotional reactions to the two different versions of the same story. Participants were randomly assigned to one of two conditions. The spinal unit is a special department of the hospital where patients who have suffered trauma to the spine are hospitalized. These are patients who in most cases will remain paralyzed. In this unit they are welcomed and re-educated, both from a physical and psychological point of view. Such patients are subjected to very strong traumatic and post-traumatic stress. Many of them wish to die when they learn of the physical state into which they have fallen. Likewise, people who work with them or their family members and / or caregivers are subjected to very high levels of emotional stress.

2.2.3 Stimulus materials and messages

All participants were informed of the purpose of the study and were given the guarantee of anonymity. The two stories used in the study 2 were created from scratch. They tell of a physical trauma that produces psychological consequences and a post-traumatic symptomatology in the protagonist. Story 1, structured as a blog, was inspired by the experimental study of Hoeken and Sinkeldam.[21] Story 2, on the other hand, was created to achieve the following goals: (i) indirect narrative instance; (ii) neutralization of the emotional shift; (iii) neutralization of perceived realism. The first story tells, through a blog, the consequences of a car accident involving a football player who will have an amputated leg. The protagonist writes directly, in first person, in his blog. To increase the perceived realism, some follower comments are reported, and the participants are informed that it is a true story that happened to a real person. Furthermore, forms of concealment of real data concerning the protagonists for privacy issues are simulated. Before the end of the story, the protagonist's wife takes the floor on the blog to communicate to followers that her husband's health has worsened. In this way the dysphoric emotional value of sadness is stressed to prepare the transition (emotional shift) to the positive emotional value that characterizes the final part of the blog, where the protagonist is saved and finds a happy life dimension. In the second story, the participants are informed that it is an untrue story. Before the story, participants were informed that the story was a newspaper article extracted from the entrance tests in a prestigious school of narrative journalism. The story takes up the facts narrated in story 1 by recounting the footballer's accident and its consequences but using an anonymous journalist as narrator who gives a voice to the protagonist's wife. The emotional value of the story, however, is always positive right from the start.

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[21] Hans Hoeken, Jop Sinkeldam, *The Role of Identification and Perception of Just Outcome in Evoking Emotions in Narrative Persuasion*, «Journal of Communication», 64, 2014, pp. 935-955.

2.3 Results

Although we used diagnostic tools to detect post-traumatic stress syndrome, we did not apply the scoring suggestions of the scales used. In the case of TSC-40, however, only the total score or the score for individual sections relating to specific disorders is evaluated. In the case of the PTSD Checklist, there is a more detailed reading protocol. However, it is suggested, as the easiest way, to score the PCL is to add up all the items for a total severity score. A total score of 44 is considered to be PTSD positive for the general population while a total score of 50 is considered to be PTSD positive in military populations. A second way to score the PCL is to treat "moderately" or above (responses 3 through 5) as symptomatic and anything below "moderately" (1 and 2) as non-symptomatic. Then use the DSM scoring rules to make a diagnosis. That is: You need an endorsement of at least 1 B item (question #s 1-5); You need an endorsement of at least 3 C items (question #s 6-12); You need an endorsement of at least 2 D items (question #s 13-17). That is, the requisite number of items within each cluster are met at a 3 or above AND the total score is above the specified cut point.

To confirm H_1 we simply projected the total score of the two scales (PTSD-PCL and TSC-40) on a decimal scale and we compared the two values determining if there had been a decrease and an increase in the levels of emotional stress after the treatment. narrative. Before the calculation, however, to equalize the comparison between the two scales, we had to introduce a mathematical corrective. The TSC-40 scale provides the value 0 while the PCL-C does not. To equate the values, therefore, we have transformed the TSC-40 score scale from 0-3 to 1-4, to assign the same numerical weight to each scale. The correction was made necessary because in the TSC-40 scale the value 0 is foreseen, while in the PCL-C it is not foreseen. To make these changes we intervened directly in the matrices of the excel sheet. Only after this operation were the values projected on decimal scales. To demonstrate H_1 we read only results in the sample of students, because in the Spinal Unit we did not use a control group.

To respond to RQ_1, we performed an ANOVA test comparing the response means for each single item in the two scales administered at every group assigned to a narrative condition.

2.3.1 Verification of H1

From the comparison of the total scores totaled by each individual participant in the experimentation groups, it appears that in all the conditions of experimentation (Groups A and B assigned to reading the stories and Group C of control) there is a decrease in the values of emotional stress when passing from compiling the PCL-C to compiling the TSC-40. Only in one case for each single group is there an increase. From the comparison of the means of the values (Fig. 8) obtained by subtracting the total score obtained on TSC-40 from the total score obtained on PCL-C, the decrease in stress is stronger in group B, assigned to the reading of a fake newspaper article , while it is lower in group A, assigned to reading the blog (Group A M. 0.76; group B M. 1.43; Group C M. 1.16).

GRUPPO B		
PCL-C score	TSC-40 score	Difference
7,88235294 >	5,78125	2,10110294
8,82352941 >	6,640625	2,18290441
4,11764706 >	3,984375	0,13327206
6,82352941 >	4,0625	2,76102941
7,29411765 >	4,140625	3,15349265
7,17647059 >	5,703125	1,47334559
3,52941176 >	3,203125	0,32628676
7,76470588 >	5,546875	2,21783088
3,64705882 <	3,90625	-0,2591912
6,58823529 >	4,453125	2,13511029
4,58823529 >	4,53125	0,05698529
8,47058824 >	7,34375	1,12683824
3,64705882 >	2,890625	0,75643382
5,29411765 >	3,4375	1,85661765
7,17647059 >	5,703125	1,47334559
5,52941176 >	4,140625	1,38878676
		*M.*1,43026195

Fig. 8 Mean of emotional stress decrease

Even if H_1 is not entirely verified, especially if we consider the comparison between Group B, assigned to one of the two conditions of narrative treatment, and control group C, assigned to the condition of absence of narrative treatment. The result appears even more significant if we consider that Group B is the one in which the average of the initial emotional stress values, calculated with PCL-C is the highest (PCL-C M. 52.25 vs Group A M. 50.1 and Group C M. 50.66).

2.3.2 Answers to narratological questions (RQ₁)

From the analysis with one-factor ANOVA, applied on the average values for each single item recorded by the two groups subjected to narrative treatment in the PCL-C administered after the reading, it emerges that the behavior of the interviewees is not statistically different (p-value 0.29). It follows that the three narratological parameters identified as variables in the construction of the stories did not significantly affect the level of emotional stress of the participants. The same result was obtained with the participants of the spinal unit (Fig. 9).

Analisi varianza: ad un fattore

RIEPILOGO

Gruppi	Conteggio	Somma	Media	Varianza		
GRUPPO A	32	33,6	1,05	0,44709677		
GRUPPO B	32	28,4	0,8875	0,3143246		

ANALISI VARIANZA

Origine della variazione	SQ	gdl	MQ	F	Valore di significatività	F crit
Tra gruppi	0,4225	1	0,4225	1,10976659	0,296220968	3,99588713
In gruppi	23,6040625	62	0,38071069			
Totale	24,0265625	63				

Fig. 9 ANOVA reaction to narrative structures (spinal unit)

2.4 Discussion

The verification of H₁, as already highlighted in study 1, confirms the thesis of numerous scholars who credit the importance of narration in the field of medicine and more specifically as an adjunct in the treatment of emotional stress' forms. However, what is interesting to note is that storytelling can become a conscious practice of disseminating information and stimulating emotional states, active on a social level not only in contexts such as the medical one. Probably, the greatest usefulness of knowledge on the relationships between narrative structures of content and cognitive processes of users is linked to its future application in the social field on a large scale, particularly in the content industry. To date, we remind you, knowledge of this type is implemented above all in the economic sectors (behavioral economics, marketing, financial markets) but in the future it is desirable to apply them for social purposes not necessarily bound to the principles of economic interest. and profit.

As for the second part of the study, as already highlighted, we do not believe that the absence of differences in the reactions of groups A and B can confirm the thesis that the thematic content affects much more than the narrative structure. Numerous scholars[22] (Hyunyi Cho, Lijiang Shen, and Kari Wilson 2014; Hall 2003; Adaval & Wyer 1998; Cho & Boster 2008; Morgan, Movius, & Cody 2009) have shown that this is not true. It is true that our study has some limitations.

3. Limitations

The two studies presented showed the existence of some both general and specific limitations. From a general point of view, the experimental setting adopted, that is the on-line modality, proved to be particularly ineffective. It certainly affected the participants' motivation to respond, and did not foster an atmosphere useful for reflection, necessary both in the case of the production of the story (study 1) and of reading (study 2). The remote mode, therefore, proved to be much more effective for obtaining objective data or previous opinions of the participants, obtainable with a very low compilation time. Another general element that has limited our studies is the number of participants. Overall, the volume of participants was rather low to be able to work with statistical tools.

Regarding specific limitations, we point out two. The first concerns the TSC-40 scale. In the case of the TSC-40 scale, only a few items were suitable for a sample of participants who are not formally affected by trauma and post-traumatic syndromes. The TSC-40, in fact, is structured more likely as a medical record and, therefore, it is less suitable for interviewing healthy people. Many items refer to pathological situations and many that are difficult to confess in an experimental set like ours. Moreover, these items create a kind of prejudice because they carry a negative emotional tone. the other limitation concerns the ANOVA test. The use of the ANOVA test allowed only the most obvious results to emerge. As already pointed out by Bortolussi & Dixon and Lane, Miller, Brown, & Vilar,[23] it is preferable to use a likelihood ratio test rather than a null hypothesis test. Texts such as ANOVA, in fact, in the context of studies on narration greatly limit the possibility of obtaining validations and are less useful for discovering trends in people or in exploratory research phases.

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[22] See footnote 10.
[23] Bortolussi, Dixon, *op. cit.*; Rebekah Lane, Ann Neville Miller, Christopher Brown, Natalie Vilar, *An Examination of the Narrative Persuasion with Epilogue through the Lens of the Elaboration Likelihood Model*, «Communication Quarterly», 61, 4, 2013, pp. 431-445.

4. Acknowledgments