



Character mediation of story generation via protagonist insertion

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ABSTRACT

The current study set out to examine how the presence or absence of depicted characters in visual narratives influences the degree of character-related content in improvised stories. The experiment consisted of trials of oral storytelling that were prompted by wordless comics. The degree of character content in the storylines was varied from being character-based—showing people engaging in social interactions—to being characterless, for example scenes depicting natural phenomena. An intermediate “character-implied” condition was also investigated, exemplified by the scene of a tornado passing through a town, where no people were depicted but in which their presence was strongly suggested. Linguistic content analysis of 472 stories demonstrated indistinguishable use of third-person pronouns (she/he) between character-implied and character-containing scenarios. An analysis of character presence demonstrated that storytellers inserted protagonists into the character-implied stories as vehicles for the actions taking place. This phenomenon reveals the character-driven nature of story creation.

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Introduction

Humans are a storytelling species (Boyd, 2009, 2018; Gottschall, 2012), and the expression of narrative is a central facet of human interaction (Clark, 2016; Robinson, 2005). Storytelling takes many forms, including everyday conversational discourse, public storytelling in indigenous cultures, religious sermons, theatrical performances, cinema, mime theatre, narrative forms of dance, through to static forms such as literature, paintings, comic strips, and photographs. Oral storytelling serves important evolutionary functions for human societies by conveying critical information about prosocial norms, social networks, cooperative behaviour, and strategies for coping with threats (Bietti, Tilston, & Bangerter, 2018; Dunbar, 2014; Mar & Oatley, 2008; Scalise Sugiyama, 1996, 2017; Smith et al., 2017; Wiessner, 2014). Conversational narratives are an important means of exchanging social information and strengthening social bonds (De Fina & Georgakopoulou, 2012; Fludernik, 1996; Labov, 2001). Hence, narrative is intimately associated with the affairs, relationships, emotions, and problems of people living in social groups.

However, many literary and cognitive models of narrative do not reflect this focus on people, but instead emphasise the sequence of episodes that comprise the plot. Indeed narrative structure has been described in a plot-driven manner ever since the time of Aristotle's *Poetics*. Aristotle strongly prioritised plot over character in his analysis of drama. Aristotle argued that, in drama,

the imitation of character is not the purpose of what the agents do; character is included along with and on account of the actions. So the events, i.e., the plot, are what tragedy is there for, and that is the most important thing of all ... [T]he plot is the source and (as it were) the soul of tragedy. (Aristotle, 335 BCE/1996, pp. 11–12)

Hence, characters for Aristotle are essentially reduced to their actions, and what ties their actions together is the plot, which he defines as the “organization of events” (p. 11).

This view is mirrored in much recent theorising about narrative in what Fludernik (1996) refers to as the “events-in-succession” model of narrative. For example, Abbott (2008) defines narrative as “the representation of an event or series of events” (p. 13). He also argues that a second critical

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ingredient in a story is what he calls “entities”, which in most cases refers to characters. Cohn (2013), in a model of visual narratives such as comic strips, has argued that the study of narrative should dissociate a level of “narrative structure” about the hierarchical organisation of episodes from a level of “semantic structure”, which includes, among other features, everything psychological related to characters, such as their motivations, emotions, and relationships. According to the thinking espoused by these theorists, it is the story that moves the character, rather than the character that moves the story. Thus, when it comes to psychological constructs like goals, Cohn (2013) argues that “[G]oal-direction is a feature of characters *in a story*” (p. 419, emphasis in original). One of the central aims of the current study was to examine what participants would do when they were prompted to create a story based on a visual plot-scenario that had no characters depicted in it. Would they convey the event-sequence in the literal manner depicted in the scenario, or would they find a way to interpret the event-sequence in a character-mediated manner through the eyes of a virtual protagonist?

The explicit incorporation of protagonist “goal states” into models of plot structure occurred with the emergence of story grammars in psychology (Mandler, 1984; Rumelhart, 1975; Schank & Abelson, 1977; Stein & Glen, 1979). According to these models, the plots of stories are seen as sequences of episodes (Mandler, 1984), with a progression leading from the presentation of a problem to the resolution of the problem and the associated achievement of a goal through the overcoming of obstacles (Arp & Johnson, 2009; Booker, 2004; Branigan, 1992; Todorov, 1971). Much work in this area has shown that stories are comprised of meaningful sequences, and that presenting the parts of a story in a different order makes the sequence less story-like, less comprehensible, and less memorable to readers (Mandler, 1984; Mandler & Johnson, 1977; Thorndyke, 1977). It is not surprising then that folk tales across cultures share a prototypical structure that reflects the basic progression of protagonist reactions and goal-directed actions that story grammars attempt to capture (Booker, 2004; Murphy, 2015; Propp, 1928/1958). As Schank and Abelson (1977) pointed out, goals are important because they drive motivation, which itself drives protagonist actions via action plans. Such goals deal with consequential “life themes”, such as hunger, sex, health, material possessions, family,

social relationships, and social status, among many others. Readers of stories monitor the goals of the protagonist throughout the narrative, since these goals make predictions about the probable actions of the protagonist.

In more recent times, the emergence of “situation models” and “event models” in cognitive psychology has further reinforced the centrality of characters and their intentionality to the nature of narrative. Situation models are mental representations of episodes derived from written narratives (Radvansky & Zacks, 2011; Zwaan, 1999, 2016; Zwaan & Radvansky, 1998). They have been applied to the comprehension of both literary and non-literary event-structures. Situation models posit a set of initial situations and their transformation into a new set of situations through causal event-processing. Zwaan and Radvansky (1998), in their classic article on the topic, described five “situational dimensions” by which readers are able to place themselves into narratives in order to comprehend their episodic structure: time, space, causation, intentionality, and protagonist. Situation models focus on how readers of verbal narratives are able to organise information about episodes based on linguistic cues regarding situational dimensions, thereby creating near and far linkages between information presented to readers across the sentences of a story. A big part of this is how readers track the protagonist across the episodes of the narrative, and how this information is updated by readers across narrative time and location. In addition, Zwaan and Radvansky (1998) point out that “a goal plan hierarchy is a highly important organisational mechanism for structuring narrated events” (p. 173). Work in this area has shown that not only are readers sensitive to the causal structure of a protagonist’s goals as a means of predicting the character’s behaviour, but that readers “behave as though they are in the narrated situation rather than outside of it” (Zwaan, 1999, p. 16).

While episodic sequencing is considered by most theorists to be a necessary component of stories (but see Fludernik, 1996), it is legitimate to ask whether it is sufficient. In the present study, we attempt to explore whether a character’s engagement in and perspective on the episodic sequence—in other words, the “mind of the character” (Palmer, 2002)—is another necessary ingredient of stories. We investigate this not by analysing published stories, but by experimentally examining how novice storytellers generate stories when

prompted with visual narratives, especially those that don't depict characters. A character-based approach to narrative generation would be consistent with the fact that stories are first and foremost about the strivings and conflicts of people (Herman, 2013; Hogan, 2013), and that the principal cultural function of stories is to inform people about adaptive behavioural strategies in the real world (Bietti et al., 2018; Mar & Oatley, 2008). The progression of a story is as much a reflection of a sequence of a protagonist's emotional states as it is the workings of an abstract grammar (Alm & Sproat, 2005; Mohammad, 2011). It thus seems reasonable to consider whether the classic dramatic arc of stories might be related to a change in a protagonist's psychophysiological state.

The current study examined this potential for character mediation of narrative by exploring how the visual presence/absence of characters in comic scenarios influenced the degree to which participants incorporated character-related content into improvised stories. The basic experiment consisted of trials of oral storytelling that were prompted by wordless 3-frame comic sequences. The independent variable was *the degree of character content* of the presented scenario. The content varied from being highly character-based—depicting people engaging in social interactions—to being characterless, for example scenes of natural phenomena like earthquakes impacting natural objects like mountains and trees. A critical intermediate condition was also examined, exemplified by the scene of a tornado passing through a town, where no people were explicitly depicted but in which their presence was strongly suggested. These “character-implied” scenarios are the most interesting test cases since they should reveal whether storytellers employ a character-based perspective as their default mode of narrative generation, even when characters are not visibly depicted. There were thus three types of comic scenarios, as based on a gradient of character presence in the scenarios: (1) character-based, (2) character-implied, and (3) characterless.

Two dependent variables were examined. First, a linguistic content analysis was carried out, with a focus on the use of personal and impersonal pronouns. In principle, character-based stories should employ personal pronouns (she/he) in order to describe the actions of the human protagonists depicted in the scenarios. By contrast, the characterless stories should be dominated by impersonal pronouns (it-related words) in order to describe the

presence of non-human objects depicted in the scene, both inanimate and animate. Regarding the intermediate character-implied scenarios, storytellers could convey them either (1) in a literal and descriptive manner as a sequence of events using impersonal pronouns (much as the characterless scenarios were predicted to be), or alternatively (2) in a character-driven manner using personal pronouns (as the character-based scenarios were predicted to be). For the latter to occur, storytellers would have to *insert* characters into the stories to serve as protagonists. As a second type of dependent variable, we did a counting and typological analysis of the characters present in the produced stories. We predicted that if characters were indeed inserted into the character-implied stories, they would act more as passive witnesses of the events depicted in the scenarios, rather than as active agents the way that standard protagonists are. As a result, we predicted that they would engage more in processes of emotional appraisal than in goal-directed actions. The overall aim of the study was to characterise how people conceptualise stories during story generation and use narrative elements to convey something that is either character-driven or not as a function of the implied character content.

Cohn's (2013) “narrative grammar”, itself based on visual narratives similar to our own, is useful to consider here. The model is based on a hierarchical sequencing of narrative constituents, progressing from “establishers” to “initial situations” and then culminating in “peaks” followed by “releases”. Our three-frame comics were designed to have a standard arc-like structure to them, as per Cohn's grammar. Since all of the comic examples that Cohn presents in his articles contain people, it is not possible to dissociate characters from the proposed narrative structure. However, two of the three categories of comics in the present study do not contain people, and so this permits us to factor out the arc-like structure of the narrative's plot and to examine what impact the presence or absence of characters has on the participants' generation of stories. If episodic features related to the narrative arc are what drive people's story generation, then stories based on the characterless and character-implied scenarios should lean on the side of being literal descriptions of the depicted events. However, if story generation is driven by characters and their psychological states, then people should convey the stories through the eyes

of a protagonist, in this case a virtual one that is not explicitly present in the scenario.

Methods

Participants

Participants were recruited from the undergraduate participant pool in the department of psychology ($N=20$, 11 females, M age = 18.9 years, $SD=1.0$). The recruitment information recommended that participants be people who frequently engaged in reading novels, stories, and/or comics. Participants were required to speak English as their native language and to have normal or corrected-to-normal vision. They received course credit for their participation. Prior to starting the experiment, participants provided written informed consent. The study was approved by the McMaster Research Ethics Board.

Stimuli

We devised scenarios for 36 comic stimuli and then paid a professional artist to illustrate the comics as simple cartoon-style drawings. Each comic contained three frames in order to indicate the temporal progression of a story plot: (1) an introductory frame, (2) a frame that introduced uncertainty and/or suspense, and (3) a concluding frame that resolved the uncertainty by depicting a valenced outcome (either positive or negative) of the situation. This shows some similarities in design to Magliano, Larson, Higgs, and Loschky's (2016) use of a beginning state, bridging event, and end state. The comics were only used as prompts for story generation, and were not the narratives of interest for the study, which were the oral stories improvised by the participants.

Three narrative conditions were created by varying the degree of character content in the comics (see Figure 1 for examples). *Character-based* (CB) scenarios depicted human characters engaging in social interactions, such as a passenger at an airport going through a security line. One, two, or three principal characters were visually depicted in these comics. At the other extreme, *characterless* (CL) scenarios depicted the impact of natural phenomena on natural objects, for example the impact of an earthquake on trees in a forest. Humans were not depicted in such scenarios, nor was there any implication of human presence or

consequentiality. Comics in the intermediate *character-implied* (CI) condition, just as those in the CL condition, did not visually depict humans. However, these scenarios strongly implied the presence of humans by depicting scenes involving human artifacts, human agency, and/or the implied consequences of some external factor on people. As shown in Figure 1B, one CI comic displayed the scene of a tornado passing through a town, where no people were explicitly depicted in the scene but in which their presence was strongly implied by the occurrence of objects associated with human life, such as a house, a bicycle, and clothes on a clothesline. The Appendix presents transcribed examples of CB, CI, and CL stories produced by individual participants.

The 36 comics were rated in a validation study by 32 participants not taking part in the current storytelling study (mean age 19.8 years, 24 females). Using 7-point Likert scales, the participants rated each 3-frame comic scenario with respect to (1) valence (negative to positive outcome), (2) intensity (low to high), (3) time-span of the events (very short to very long), and (4) human impact of the events (no people/no impact to many people involved/many people impacted). From these ratings, we selected eight comics for each of the three conditions whose mean values were matched with respect to the first three validation parameters ($p > 0.05$ in one-way analyses of variance), but in which half of the stories of each category had positive-valenced outcomes and half had negative-valenced outcomes. The full set of 24 comics used in the study is presented in Supplementary Figure 1.

Procedure

Participants completed the experiment inside of a sound booth. E-Prime 2.0 (SP2) was used to present the comics to participants on a desktop computer. Story recitations were recorded into Adobe Audition CC 2015 using a head-mounted microphone connected to a blue icicle interface. Participants were trained on the storytelling task using three practice comics, one from each character category, although they were unaware of these categories. After completing the practice phase, participants were presented the 24 experimental comics in random order and asked to compose a story about each one. The task instruction was to "develop an idea for each story that binds the three frames of the comic together". Participants

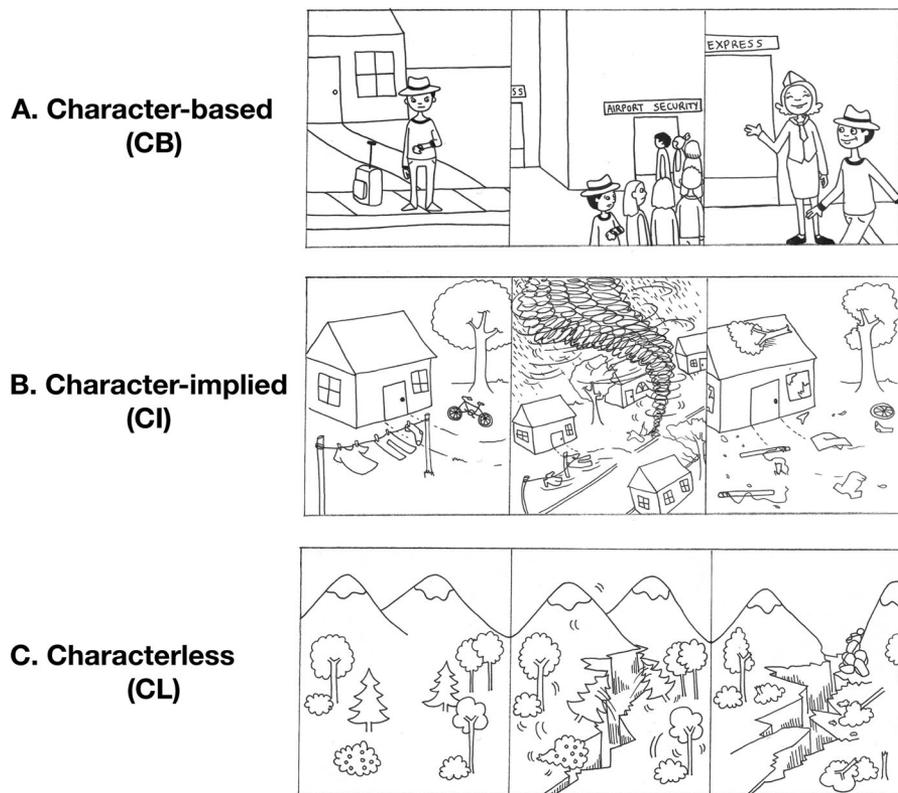


Figure 1. Sample comics for each of the three categories of stories. A. An example of a character-based (CB) comic. B. An example of a character-implied (CI) comic. No human characters are depicted, but there is a strong suggestion of human presence and consequentiality. C. An example of a characterless (CL) comic. Neither human characters nor human consequentiality is depicted.

were instructed to avoid placing themselves into the stories or to use the scenario of a comic as a point of departure for telling a personal story about themselves or someone they knew. In addition, they were told not to recount an established narrative, such as a film or book plot. Finally, they were instructed to minimise their use of metaphors or symbolic interpretations unrelated to the comic depictions. In other words, they were encouraged to stick closely and literally to the narrative presented in each comic and to produce an original story.

Participants were given 2 min to create each story, preceded by a 30s planning phase. The comic remained on the screen during both phases. On-screen warnings were presented 30s and 10s before the end of the 2-minute storytelling phase. Participants proceeded through the series of comics at their own pace and were allowed to take breaks as needed. The experiment took 60–90 min to complete. Each of the 20 participants produced 24 stories, for a total data set of 480 stories. Eight stories were excluded from the analyses (1.7%),

resulting in a dataset of 472 stories. Stories were excluded if participants demonstrated a lack of understanding of a given comic scenario (i.e. their story contained information that contradicted what was depicted in the comic) or if the valence of the story's outcome was opposite to that depicted in the third frame of the comic, since the latter too represented a misunderstanding of the comic's narrative content. It is important to point out that the stories that were produced in this study were the *verbal* stories generated by the participants, not the comic scenarios. The comics were merely prompts for story generation. The actual stories for analysis in this study were the verbally-generated participant-produced stories.

Data analysis

Linguistic content analysis

The stories were manually transcribed from audio into text according to the guidelines for Linguistic Inquiry and World Count (LIWC; Pennebaker, Booth, Boyd, & Francis, 2015). The word “um” was

inserted as a placeholder for non-fluencies in order to exclude words that did not contribute to story content. A linguistic content analysis was performed on the story texts using the programme LIWC 2015, which counts the number of words in a text that belong to specific categories of words in a loaded dictionary, and then expresses this as a percentage of the total number of words in a text. Predicted differences between stories for the CB, CI and CL conditions were examined using the following word lists: (1) third-person pronouns (LIWC list 7, *she/he*); (2) it-related words (the set of eight it-related words from LIWC list 9, *IPron*); (3) social words (LIWC list 40, *social*); and (4) words about personal achievement (LIWC list 82, *achieve*). Word lists that served as negative controls for which we predicted no differences among the three story categories were: (5) words about the future (LIWC list 92, *focus future*); (6) words about causation (LIWC list 52, *cause*); and preposition use (LIWC list 11, *prep*). We also examined the mean word count of the stories across conditions.

Several modifications were made to word lists of interest in the LIWC 2015 dictionary according to LIWC guidelines in order to reduce redundancies between lists. First, because the *social* category contained words that also occurred in other lists of interest (*she/he* and *it*), we omitted the overlapping words from the *social* list. Likewise, because the *social* list contained relevant words that were not included in the *she/he* list (i.e. “he’ll”, “he-*” and “she-.*”), we added those words to the *she/he* list. We removed all words beginning with “you” from the *social* list because participants sometimes used this word to refer to the implied listener of their stories. We removed all words that overlapped with the *they* list (LIWC list 8), since “they” can be used to refer to inanimate objects, not just people. We omitted “family”, “fam”, and “families”, since several CB comics depicted family interactions, and we did not want this difference between conditions to confound the results. Finally, we reiterate that we used only the eight it-related words from *IPron* (LIWC list 9) to create our “it” list. Supplementary Table 1 presents the LIWC word lists that were used in the analyses.

The LIWC data were analysed using the *lme4* R software package (Bates, Mächler, Bolker, & Walker, 2015; R Core Team, 2013) according to a within-subjects design. One-way repeated measures analyses of variances (ANOVAs) were performed to test the main effect of condition, with the three levels of CB, CI,

Table 1. Literary features of characters within the stories.

1. Character appearance	Depiction in the scenario, insertion of a human character not depicted in the scenario, personification of non-human living things in the scenario, animation/personification of non-living things in the scenario, insertion and personification of non-human living things not depicted in the scenario, insertion and animation/personification of non-living things not depicted in the scenario
2. Species	Human, animal, animate nature, inanimate nature, supernatural/spiritual, object, indeterminate
3. Gender	Male, female, indeterminate
4. Age	Juvenile, adult, elderly, indeterminate
5. Count	Singular, mass
6. Relationship	Single, family, friendship, romantic, strangers, employees, herd, objects, society, institution, relationship unknown
7. Naming of characters	Improper noun [general noun, like “the cat” or “the people”], proper noun [a given name, like “Mary” or “Mr. Mountain”]
8. Character entrance	Early, middle, late
9. Character role	Background character, secondary character, antagonist, protagonist
10. Character agency	Observes, appraises, responds, acts

and CL, followed by post hoc Tukey’s honest significant difference (HSD) tests to examine pairwise differences between conditions. Linear Mixed-Effects Regression Models (LMER) with Satterthwaite approximation for degrees of freedom and maximum likelihood estimations were used for all ANOVAs. We also present omega squared as an approximate calculation of effect size. We corrected for the number of positive/predicted word lists using a Bonferroni correction, where $n = 4$ (*she/he*, *it*, *social*, and *achieve*). We did the same for the negative controls, where $n = 3$ (*focus future*, *cause* and *prep*).

Character counts

In addition to looking at the linguistic content of the stories, we wanted to examine the presence of characters in each story as a means of detecting whether participants had a tendency to insert characters into the CI and CL stories. The mean number of visually-depicted “principal characters” in the CB comics was 2.25 (i.e. 18 principal characters across 8 stories), and was 0 for both the CI and CL comics. Characters were defined as principal characters for the CB comics if they were present in at least two frames of the comic and they were shown to directly contribute to or influence the plot of the storyline. The remaining depicted characters were considered as “background characters” whose purpose was to provide setting information for the scenario. Since participants never used background characters as

primary characters in their stories, we only included principal characters in our calculation of visually-depicted characters for the CB comics.

Author AH, who was blind to the conditions of the study, coded for the presence of characters in each of the 472 included stories. The number of characters described in participants' stories was calculated and averaged for each of the three conditions. In addition to producing a raw character count, the coder rated 10 features of each character within a story, as described in Table 1: (1) character appearance into the story, (2) species, (3) gender, (4) age, (5) count, (6) relationship, (7) naming of characters, (8) character entrance into the story, (9) character role, and (10) character agency.

In order to calculate inter-rater reliability, author CT coded a random selection of 25% of the 472 stories. Inter-rater reliability was computed using Cohen's kappa. The obtained values for *character appearance* were 0.89 (CB), 0.97 (CI), and 0.82 (CL), all of them indicating high reliability. The mean kappa values across the nine other character categories combined were 0.59 (CB), 0.68 (CI), and 0.62 (CL), again indicating high reliability in character coding.

Results

Linguistic content analysis

Stories ranged in word count from 59 to 369 words, with a mean of 220 ± 59 words. A one-way repeated measures ANOVA revealed a main effect of condition on mean word count ($F(2, 446) = 15.80, p < 0.001, \Omega^2 = 0.59$). Tukey's HSD tests revealed that CB and CI stories were not different from each other ($p = 0.999$), but that both had significantly higher word counts than CL stories ($p < 0.001$ for both comparisons). This effect reflected an approximately 20-word difference between CB/CI and CL. Because of this difference, we used word count as a regressor of no interest in all of the statistical analyses reported below.

Because all the stories were predicted to be narrations about past events, we expected that words about the future would serve as a reasonable negative control. As predicted, there was no significant difference in *focus future* words across the three categories of stories ($F(2, 450) = 2.51, p = 0.082, \Omega^2 = 0.18$). In addition, there was no significant difference in *cause* words about causation ($F(2, 451) = 0.79, p = 0.484, \Omega^2 = 0.17$), suggesting that the stories were

matched for general plot features across the character categories. Finally, there was no significant difference in *preposition* use across the three categories of stories ($F(2, 450) = 0.96, p = 0.383, \Omega^2 = 0.23$).

The analysis of interest was the *she/he* list of personal pronouns, which should narratively indicate the presence of human characters in the stories. (Note that "they", "them" and related words cannot be used for this since these words can refer to inanimate objects in addition to people). A one-way repeated measures ANOVA revealed a main effect of condition for *she/he* ($F(2, 450) = 45.79, p < 0.001, \Omega^2 = 0.28$). Tukey's HSD tests indicated that CL was significantly lower than both CB and CI ($p < 0.001$ for both differences), which did not differ from one another ($p = 0.188$) (Figure 2). This result demonstrates that participants produced the CI stories more similarly to the CB stories than to the CL stories, in other words in a character-based manner.

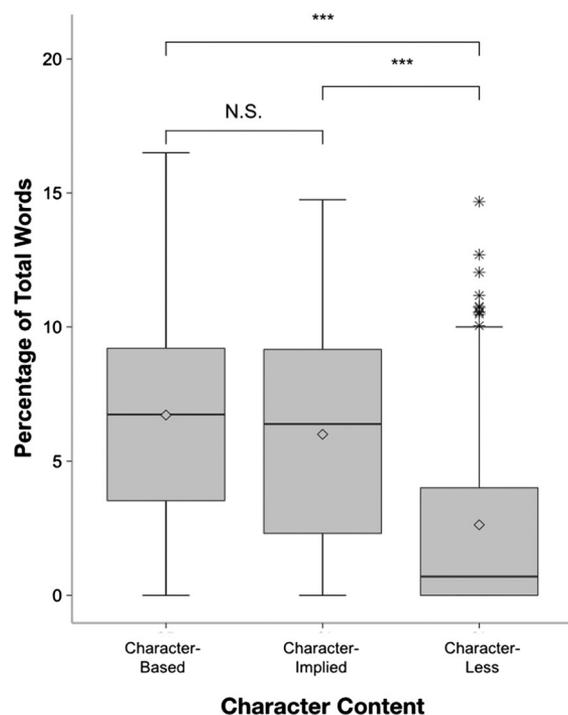


Figure 2. Linguistic content analysis of third-person pronouns, suggesting character presence. The percentage of story words comprised of words from the *she/he* LIWC list (list 7) is shown as a function of the three story categories. Lines are drawn at the 25th, 50th, and 75th percentiles in each box plot. Capped vertical bars extend to a distance of 1.5 interquartile ranges, and outliers are marked as stars. An alpha level of 0.05 was used for statistical tests, with a Bonferroni correction for multiple comparisons. N.S., non-significant. *** significant at $p < 0.001$.

These results were reinforced in the analysis of the *social* and *achieve* lists, which showed the same pattern as the *she/he* list across conditions. A one-way repeated measures ANOVA revealed a main effect of condition for *social* ($F(2, 451) = 22.64, p < 0.001, \Omega^2 = 0.20$). Tukey's HSD tests indicated that CL was significantly lower than both CB and CI ($p < 0.001$ for both differences), which did not differ from one another ($p = 0.933$). Likewise, a one-way repeated measures ANOVA revealed a main effect of condition for *achieve* ($F(2, 452) = 15.45, p < 0.001, \Omega^2 = 0.09$). Tukey's HSD tests indicated that CL was significantly lower than both CB and CI ($p < 0.001$ for both differences), which did not differ from one another ($p = 0.178$).

The reciprocal analysis of interest to the *she/he* list was the *it* list, which should indicate the presence of non-human objects (both inanimate and animate), for which we predicted that the CL stories would have the highest frequency. A one-way repeated measures ANOVA revealed a main effect of condition for *it* ($F(2, 451) = 19.83, p < 0.001, \Omega^2 = 0.18$). Tukey's HSD tests indicated that CL was significantly higher than CB ($p < 0.001$), but not CI ($p = 0.255$). (Figure 3). In addition, CI was significantly higher than CB ($p < 0.001$). Hence, CI was similar to CL in the use of it-related pronouns, and both were significantly higher than CB. This creates an interesting contrast to the *she/he* results, demonstrating that CI had the same use of personal pronouns as CB, but the same use of it-related pronouns as CL. In order to explain this somewhat paradoxical finding, we performed a qualitative analysis of the produced stories. This analysis indicated that, while the CB stories tended to focus overwhelmingly on the relationships among the characters in the scenarios, the CI stories, even those with inserted characters, tended to focus more on the situations, settings, and environments of the depicted scenarios. Hence, while the high use of personal pronouns reflects the insertion of human characters into the stories, the high use of it-related words reflects a stronger focus on setting and situational features than on personal relationships among the inserted characters.

Character counts

The mean number of characters described in the CB condition was 2.68, in comparison with the predicted value of 2.25 principal characters (see Methods). Interestingly, when the overall mean was divided into depicted and inserted subtypes, the value for

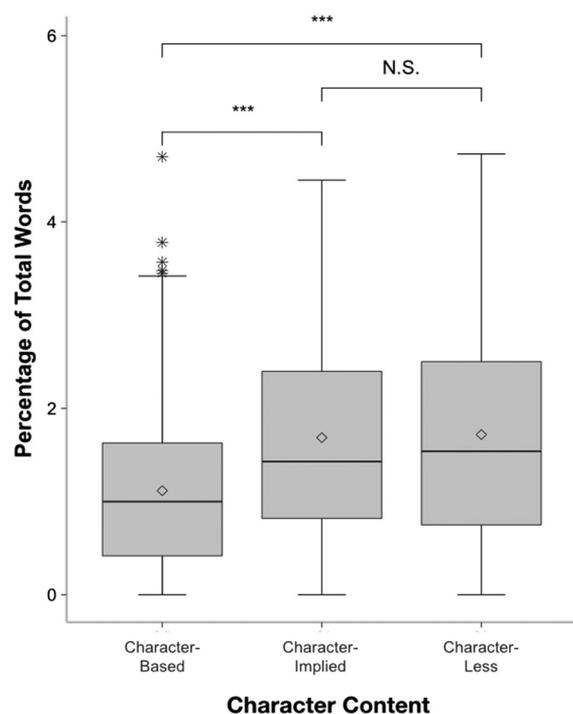


Figure 3. Linguistic content analysis of it-related impersonal pronouns. The percentage of story words comprised of eight it-related words from the *IPron* LIWC list (list 9) is shown as a function of the three story categories. Lines are drawn at the 25th, 50th, and 75th percentiles in each box plot. Capped vertical bars extend to a distance of 1.5 interquartile ranges, and outliers are marked as stars. An alpha level of 0.05 was used for statistical tests, with a Bonferroni correction for multiple comparisons. N.S., non-significant. *** significant at $p < 0.001$.

depicted was 2.25 (identical to the predicted value), and that for inserted was 0.43 (100% of them human characters). Therefore, storytellers described all of the principal characters depicted in the comics when creating their stories, but also showed a slight tendency to insert additional characters beyond that, all of which were human characters.

For both the CI and CL stories, 0 characters were depicted in the comics, and so any presence of characters in these stories would be evidence of character insertion. In fact, the occurrence of insertion in both types of stories was striking, in agreement with the data based on personal pronoun use. The mean number of characters described in the CI condition was 2.00. In other words, storytellers inserted, on average, two characters into each CI story. Of these characters, 97% were human (Figure 4, middle panel). The mean number of characters described in the CL condition was 1.70. However, only about half of these (54%) were human characters (Figure 4, right panel), consistent with the findings on

personal-pronoun use (Figure 2). Regarding the non-human characters, 35% of the characters in the CL stories were entities already depicted in the scene that were personified (either living things or non-living things that were animated and personified), while 11% of the characters were entities that were inserted into the scene and were then personified (either living things or non-living things that were animated and personified) (Figure 4, right panel).

A total of 1022 characters was identified across the 480 stories in the study. Figure 5 quantifies the inserted characters (combined across all three conditions) with respect to 10 categories of features, including the feature of “appearance” just described (see the Methods section for details). This is akin to analysing the process of “characterisation” by which writers create characters for stories (Schmidt, 2001). Inserted characters in general were juvenile or adult humans, occurring as single individuals or family members. They appeared early in the story as protagonists, often times having the agency to act. Hence, it appears that storytellers planned their stories around these inserted characters as important story components, rather than having these characters be passive observers that appeared after the main action of

the story had been completed. Figure 6 highlights the literary properties of character appearance, role, and agency for each of the three categories of stories. Note that, whereas Figure 5 excluded information about depicted human characters in the CB stories, this figure covers *all* characters, regardless of type. As can be seen, the patterns of character appearance, role, and agency were strikingly similar across all three categories of stories, despite the fact that CB stories had a higher absolute number of characters, and despite the fact that the majority of characters in CB stories were depicted characters, while all of the characters in CI and CL stories were inserted characters (or personifications of depicted non-human entities). This further reinforces the general character-driven approach that storytellers brought to the CI and CL stories.

Discussion

In order to examine whether people intrinsically assume a character-centred perspective on narrative as their default mode of story generation, we had novice storytellers orally improvise stories based on wordless 3-frame comic stimuli representing standard plot scenarios. We manipulated the

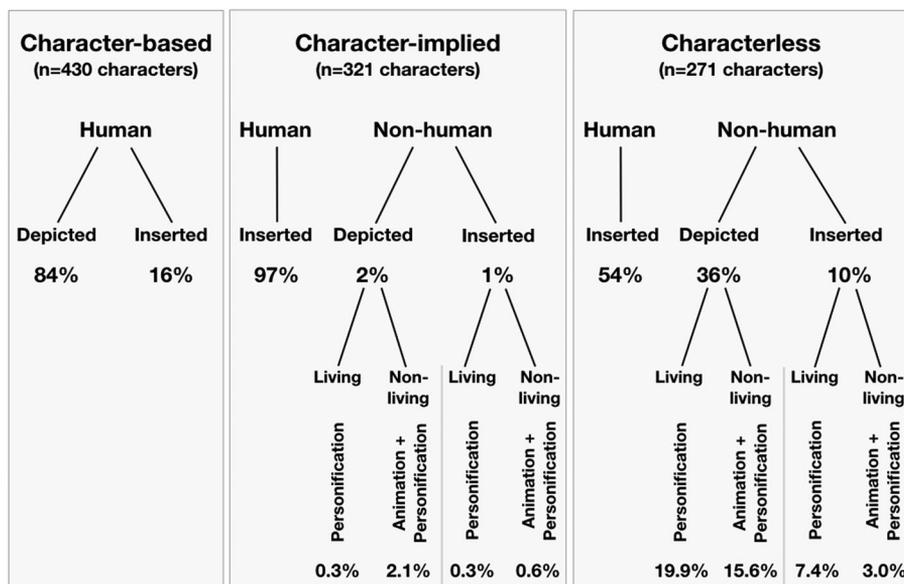


Figure 4. Analysis of character counts. The three panels show the raw character counts across the eight stories and the 20 participants for each of the three categories of stories. For the character-based stories, only human characters were described, a large majority of them being characters visually depicted in the comics. For the character-implied (CI) and characterless (CL) stories, all of the characters were inserted by storytellers. For the CI stories, the vast majority of these were human characters. For the CL stories, only about half of them were. The rest were a series of living or non-living non-human characters. Some of them were entities visually depicted in the scene, while others were inserted into the scene. The living things underwent personification to become characters, while the non-living things underwent both animation and personification in order to do so.

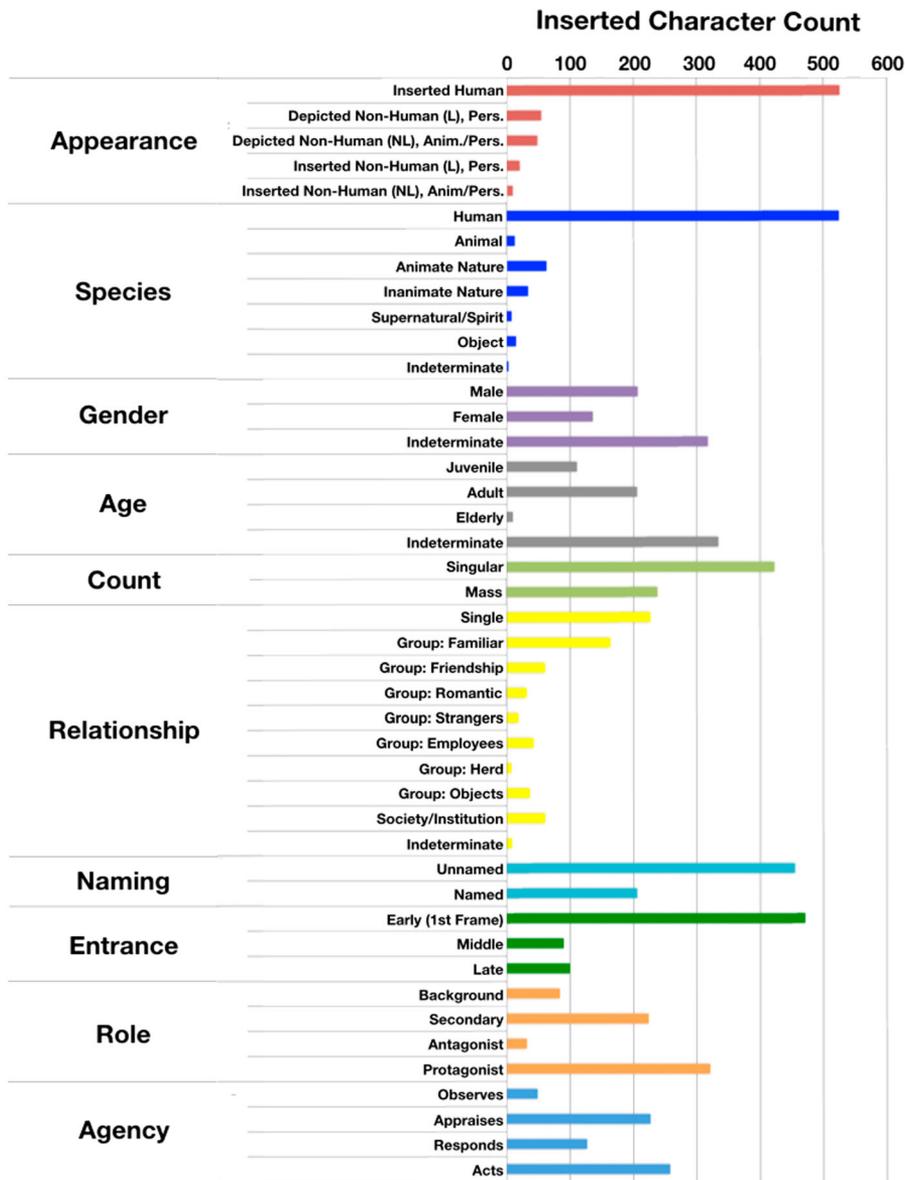


Figure 5. Properties of inserted characters across all stories. The figure shows 10 literary properties of the inserted characters, as combined across the three categories of stories. See the Methods section for a description of the 10 properties and their potential codings. Note that the first property, called “appearance”, represents the same information as shown in Figure 4, except that it is collapsed across all story categories here. Note that, in addition to inserted characters, this figure includes *depicted non-human* characters, including both living things (animals, plants) and non-living things. Abbreviations: Anim., animated; L, living; NL, non-living; Pers., personified.

presence of characters in the scenarios from being character-containing to being characterless. We predicted that the character-based scenarios would lead to stories centred around the depicted characters, that the characterless scenarios would lead to descriptive stories without characters, and that the character-implied scenarios might lead to character mediation via character insertion due to the clear representation of human consequentiality in the scenarios. In keeping with the latter prediction, we saw a strong tendency for storytellers to insert

human characters into the CI stories, as demonstrated by three independent person-related word lists in the linguistic content analysis and by a counting and typological analysis of characters in the produced stories. However, contrary to our predictions, we also observed a large amount of character insertion into the CL stories, although roughly half of those insertions were of non-human characters (a combination of living and non-living things). Since we are unaware of any comparable results to these in the narrative-psychology literature, these

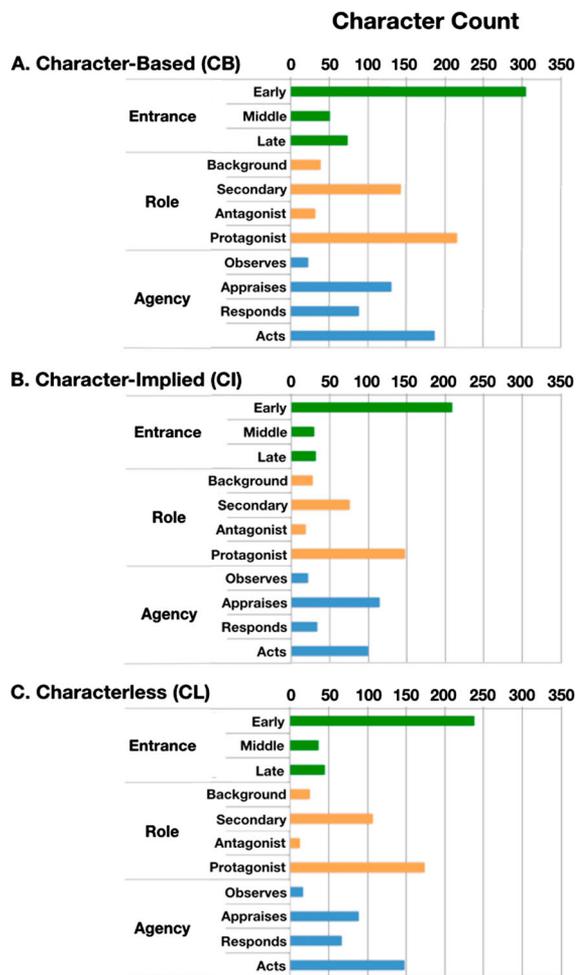


Figure 6. Properties of characters for the three story categories. The figure shows the same type of plot as Figure 5, but does so separately for each of the three categories of stories, and only for the literary properties of character entrance, role, and agency. Also, whereas Figure 5 excluded information about depicted human characters in the character-based stories (since it only described inserted characters), this figure includes *all* characters, regardless of type.

findings provide some of the first evidence that people adopt an intrinsically character-centred approach when engaging in storytelling, even when human characters are not present in the scenarios being described. We call this phenomenon “protagonism”, suggesting that the process of story creation is character-driven, as propelled by a central protagonist, even when one is not explicitly suggested in the storyline. If anything, the CL results suggest that this tendency is far more pronounced than we had predicted, and that animate non-human beings (plants, animals) and inanimate objects can be inserted, animated, and personified for the critical purpose of serving as story protagonists.

What we are calling protagonistism is the fundamental discursive function of establishing a single character’s perspective when processing a story, whether in production or perception. In real life, events typically involve multiple individuals or even masses of individuals. While histories and news stories are often about mass protagonists, literary stories generally are not. Literary stories view multi-person events from the point of view of a single protagonist, and appraise the outcomes with reference to that person’s interests and welfare (Abbott, 2008; Bortolussi & Dixon, 2003; Fludernik, 1996). This process carves out that character’s perspective and distinguishes it from the perspectives of all of the other people taking part in the event. In the limiting case, it generates the source of such a perspective *de novo* via character insertion when such a source is not explicitly present in the event, such as in the scenes of nature in our CL stimuli. The results presented here suggest that it is not sufficient for storytellers to convey episodic and causal sequences in a character-free manner by employing “event models” or event hierarchies alone. The key issue here is not about the nature of plot structure, but about the *strategies* that storytellers adopt when tasked with creating a story based on visual stimuli that do not explicitly depict characters. Character-mediated storytelling is a reflection of what Bruner (1986) calls the narrative mode of thinking, in which events are explained intentionally with reference to psychological causation, compared to the scientific mode of thinking, in which events are explained via physical causation. For example, the scenario depicted in Figure 1C could be conveyed using either the scientific mode (an earthquake creating to a chasm in the earth) or the narrative mode, involving mediation by characters. The latter takes advantage of mechanisms such as character insertion, animation, and personification. In Trabasso and Nickels’ (1992) classic developmental study, in which participants (both children and adults) were asked to tell a story about the events depicted in a picture book, the authors found a trend towards increasing inclusion of the protagonist’s goal plans, purposes, and goal-directed outcomes with the increasing age of children, from 3 to 9 years old.

These results are supported by the thinking of a large number of scholars in cognitive narratology, who argue that stories are first and foremost about the experiences of characters, rather than about episodic sequences or actions per se. In *Affective*

Narratology, Hogan (2011) attempts to ground narrative theory in the context of affective science, driven by the contention that emotion is at the root of narrative patterns. More specifically, he states that “stories are defined, first of all, by the goals of characters and, crucially, that those goals are produced by emotional responses to situations” (p. 78). Hence, stories are comprised of action sequences that are directly driven by goals that are emotionally consequential for the protagonist. According to Fludernik (1996), there can be “narratives without plot, but there cannot be any narratives without a human (anthropomorphic) experiencer of some sort at some level” (p. 13). Narrative should thus be centred on the “experientiality of an anthropomorphic agent” (p. 26), where she refers to such agents as actants or existents. Fludernik’s use of the term anthropomorphic, rather than human, in this context is quite relevant to our observation of the personification and animation of inserted protagonists, in which our participants anthropomorphised both animate and inanimate objects. For Herman (2013) as well, stories have a deep psychological component to them: “narratives are bound up with ascriptions of reasons for acting that consist of clusters of beliefs, intentions, goals, motivations, emotions, and other related mental states, capacities, and dispositions” (p. 23). He adds that “narratives afford a means for making sense of experience by allowing intentions and other reasons for acting to be provisionally ascribed to persons in storyworlds” (p. 57). Zunshine (2006) too argues that a major part of reading a story is connecting to the mental states of characters by employing theory-of-mind mechanisms. Palmer (2002) argues that narrative theory needs to elucidate how fictional minds operate within the context of storyworlds, what he calls “the social mind in action”. This includes “short- and long-term intentions, plans, goals, motives, and reasons for action” (p. 36). All of these theorists argue that stories are fundamentally about the psychology and experientiality of characters, not about episodic sequences per se. If this is indeed the case, then it would stand to reason that storytellers, when given the task of creating stories based on scenarios that lack actants, would furnish these actants de novo in order to ensure that the narrative’s content is ultimately about the “experientiality of an anthropomorphic agent”. Note that most of these theories are based on written storytelling, which might be considered as less “natural” than oral storytelling (Fludernik, 1996). However, we strongly

suspect that the process of character mediation is something that generalises across the formats of storytelling, since oral and written stories probably serve similar social functions, despite their differences in context.

Inserted characters

Our prediction regarding character insertion into CI-based stories was that the characters would appear after the major events took place and that they would thus serve as passive observers who would appraise the situation and embody the emotions imputed to people who might actually be in such situations. Contrary to this expectation, we found that, in about half of cases, inserted characters appeared early in the story (see Figures 5 and 6) and served an active role in carrying out goal-directed actions (see sample stories in the Appendix). In addition, we observed that two human characters were inserted into each CI story, on average, reflecting the social and interactive nature of inserted characters in the CI stories. These results suggest that the process of storytelling is a strong *attractor* for characters, and that storytellers convey stories via the mediation of characters, including completely virtual ones. We know of few precedents for such findings in the psychology literature. While numerous developmental studies have used wordless pictorial stimuli similar to our own to elicit story production in children, these stimuli have all been like our CB types, with clear depictions of characters/protagonists (Harris & Rothstein, 2014; Peña, Gillam, & Bedore, 2014; Peña et al., 2006; Schneider & Hayward, 2010; Schneider, Hayward, & Dubé, 2006). In addition, the emphasis of such studies has been on the complexity of the produced narratives in terms of story-grammar components, rather than on representations of characters (but see Trabasso & Nickels, 1992). Therefore, we are not aware of any prior study in either adults or children that has used pictorial stimuli that did not include visually-depicted characters in them, such as our CI and CL comics. Even Cohn’s (2013) comics are all of the CB type. The main finding of our study is that the general tendency to insert characters into stories and to animate and personify non-human entities is quite strong. Moreover, inserted characters are often active protagonists, rather than passive witnesses.

Demir, Levine, and Goldin-Meadow (2015), in a study of gestural perspective-taking during

storytelling in children, argued that “when perspective is left ambiguous or unspecified, adults spontaneously construct mental representations of narratives as if they themselves were involved in the narrative situation, and mentally simulate experiences of story characters from an internal, first-person perspective” (p. 664). This is consistent with the idea that people default to a character-based approach to stories, even if the character is oneself. Zwaan and Radvansky (1998) argued that “readers attempt to infer the goal that motivated [an] action if that goal is not mentioned explicitly in the text” (p. 173). In some respects, our results represent an extreme version of this point. Not only were participants trying to infer a goal for an observed event, but they were trying to infer a *character* to experience the observed event as a consequential action. Stories based on the character-implied scenarios jibe with what Ryan (1980) calls a “minimal departure” principle whereby a storyworld is perceived as being “the closest possible to the world that we know” (p. 403). The scenes of human life shown in the character-implied scenarios provide the strong implication of a storyworld in which people are present, rather than absent. Interestingly, the personification of animate and inanimate objects for the characterless scenarios is a violation of the “minimal departure” principle, and therefore needs to be accounted for by other mechanisms.

Animacy and personification

One of the classic findings in the psychology literature is Heider and Simmel’s (1944) experiment in which the authors showed participants an animated film of three geometric figures (a triangle, a square, and a circle) colliding with one another at the opening of a large rectangle. Viewers of these films demonstrated a clear tendency to interpret the interactions among the geometric figures anthropomorphically as if the figures were intentional agents. More than half of the participants interpreted the sequences as full-fledged stories, sometimes making the geometric figures into human characters, such as two men brawling with one another for the affections of a woman. In addition, participants reliably attributed personality traits to these figures based on their movements and interactions. Hence, it appears that viewers of these films processed the movement patterns of the geometric figures in an intentional manner using the narrative mode of cognition. While our CL stimuli were still

images, rather than films, we observed a strong tendency among storytellers to not only insert human characters into the stories (as in the CI stories), but to personify living things (plants, animals) and to jointly animate and personify non-living things in the scene, much as in the case of Heider and Simmel’s (1944) geometric figures. Hence, even with our completely stationary images, participants animated elements within the scenes and imputed personhood to them. For the comic shown in Figure 1C, the transcription presented in the Appendix describes one storyteller’s animation and personification of the two mountains in the comic as “Mr. and Mrs. Mountain”, as well as the psychological impact of an earthquake that caused the mountains’ separation by opening up the ground between them. Hence, this participant created expressive protagonists out of inanimate objects depicted in the scene. The person did so using two protagonists, again highlighting the social and interactive nature of inserted or personified characters.

There are three interesting implications of these findings regarding animacy and personification. First, many folk tales across the world, not least fairy tales, have human-like animal characters as protagonists. In the Aarne-Thompson-Uther classification of folk tales (Uther, 2004), “animal tales” are the first category, and are comprised of 300 story types about both wild and domestic animals. This is found in modern times in well-known fables dealing with the affairs of three pigs, three bears, a tortoise and a hare, and an ugly duckling, among many others. It is also found in stories like *Little Red Riding Hood* and *Puss in Boots* in which personified animals are able to interact verbally with human characters in exactly the same manner that people do. Second, the capacity for animacy is thought to serve as the cognitive basis for religious belief (Guthrie, 1993; Harvey, 2006). The earliest forms of religion are thought to have been those in which inanimate objects, such as elements in the natural world, were animated and endowed with intentionality and agency. This universal phenomenon is referred to as animism (Harvey, 2006), and is present in modern discourse when people talk about Mother Earth in the context of environmentalism (Father Sky gets much less press). A belief in supernatural agency is essentially the application of Bruner’s (1986) narrative mode of cognition to physical phenomena. In the absence of physical theories to explain consequential natural phenomena, people “narrativize” these natural events in terms of the

intentionality of a supernatural being, with the implication being that these phenomena happen “for a reason”, in the same way that human behaviour is believed to happen (Bering, 2002). Third, an important developmental expression of this phenomenon is found in the tendency of young children to animate and personify inanimate objects, such as dolls and stuffed animals, as well as their tendency to create imaginary companions (Carlson & Taylor, 2005; Harris, 2000), a process that correlates with theory-of-mind skills in children.

Neuroscience

A recent neuroimaging study from our lab has examined neural processes related to protagonism. Yuan, Major-Girardin, and Brown (2018) had participants create simple narrations as prompted by headlines describing transitive actions carried out by a protagonist (e.g. “Surgeon finds scissors inside of patient”). Participants had to do this across the three communicative modalities of speech, pantomime, and drawing, where the participants were university-trained artists. In order to eliminate brain activations related to purely sensorimotor aspects of the task, Yuan et al. had participants perform a control task in which they had to describe the spatial properties of objects (e.g. binoculars), without any reference to humans or human use. This was again done using speech, pantomime, and drawing. The main objective was to see if the narrative task would activate brain areas involved in episodic processing or instead character-based processing, or perhaps a combination of the two. When the brain activations for object description were subtracted out from those for narration, what was left over were activations in the so-called mentalising network that mediates theory-of-mind processing (Frith & Frith, 2003, 2006). The exact same result was seen for each of speech, pantomime, and drawing. Hence, the brain network associated with mentalistic engagement with characters was activated cross-modally, with no compelling evidence for activations in brain areas for episodic processing. This suggests that, even when drawing or miming a narrative, people intrinsically adopt the protagonist’s perspective when conveying the story. This result parallels findings from studies of narrative comprehension, suggesting that the mentalising network is activated comparably in the production and perception of narratives (AbdulSabur et al., 2014; Silbert, Honey, Simony, Poeppel, & Hasson, 2014). Hence, it seems that the adoption of the protagonist’s psychological

perspective occurs during both story creation and story perception, suggesting a character-driven approach to narrative processing.

Conclusions

When novice storytellers are given the task of creating stories based on visual scenarios that do not depict human agents, they show a strong tendency to insert characters into the stories so as to serve as the psychological vehicles for the events taking place in the scenarios. When such scenarios show typical scenes of human life, the inserted characters tend to be overwhelmingly human. However, when the scenarios are scenes of nature, roughly one third of the described characters are personified versions of living or non-living things that are already depicted in the scenario. We refer to this collection of tendencies as protagonism, reflecting the character-driven nature of story creation. Stories are not just sequences of causally-linked episodes and situations, but are manifestations of psychophysiological processes seen from the privileged vantage point of a protagonist. This suggests that the historical emphasis in literary theory on episodic structure per se may be overstated, and that a more protagonist-driven approach to narrative should focus on character processes, most especially the psychological dynamics of the central protagonist.

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Appendix

Representative stories produced by participants for the character-based (CB), character-implied (CI), and characterless (CL) scenarios. These stories are associated with the comics shown in panels A, B and C, respectively, of Figure 1.

A. Character-based story by Participant 12

Joel was going on a trip, a trip to a nice long vacation that he really did deserve. He waited for the taxi to pick him up at the block. "Wow", he said, "I only have a few hours to get ready. Where oh where is the taxi?" Finally the taxi came and picked him up. He was angry at the taxi driver. "Why are you so late?" he said. "I'm sorry", said the taxi driver, "But I really couldn't make it any earlier". Joel was angry and so he did not tip the taxi driver at all when he left. He went into the airport security and looked at his watch. "Why oh why is this taking so long", said Joel, "I have places to be, people to see, a vacation I need to take". But alas, the line was long, and everyone else looked like they were in a hurry too. Joel snorted, "Look at all these people standing in front of me. What are they doing? Surely none of their places to be are as important as mine". The woman in front of him was carrying a baby and the baby started to cry. Joel just rolled his eyes, "People these days". Eventually, he finally went through security. "Finally!" he said, "I can finally go on my trip". And off he went, towards this express lane. "Jesus", Joel said, "Finally I can go on my vacation". He bypassed the smiling lady in the hat, "Finally, I can go and leave this place behind".

B. Character-implied story by Participant 16 (demonstrating human insertion)

Little Miss Emily had been saving up her whole life to get a nice, neat little house at the end of the street for her and

her family. She worked every day from dusk 'til dawn, from dawn 'til dusk, just to keep that little piece of property all her own. But one day, sadly, as these things go, a large storm swept in. It ruined everything in its path. "Mom, mom, we need to go!" But Emily was torn. She worked so hard! So hard for so long to save up enough for this little house. But in the end, her safety and the safety of her kids mattered more than the house. They fled that night far, far away, while the storm swept into town. It upended trees and smashed windows. Down the street it went, destroying all the houses in its path, until it finally reached the house at the end. Emily's house. But the storm had no compassion and the storm had no love. And so it ripped and it tore, and it ripped and it tore, just as it did for every house before. Afterwards, Emily came back days and days after the storm had finally left. And what was left of her beautiful little house was shattered and ruined on the ground. She started crying. Her children went to her, arms pulling around her into a gentle hug. "Don't worry, Mom. No matter what, even if it's broken, we can work together. Work hard to restore what you once had. Don't worry. Things will be alright". Emily cried. But no matter what, she still had her own health, her own safety, and her children with her. Things were going to be alright.

C. Character-implied story by Participant 22 (demonstrating animation and personification)

Mr. and Mrs. Mountain were happily together at the top of the forest. They had all their friends, the

trees and the bushes down below, and they were happily content being next to each other for the rest of time. One day, out of nowhere, a huge crack begins to form and separate them. As the trees fall in and the bushes scatter, they start to wonder what will happen to them. What was once a strong promise bonding them together, telling each other that they would be with each other through the end of time, soon became something that they would have to break. As the chasm began to form wider and wider, more and more trees began to fall in, and the distance between Mr. and Mrs. Mountain was ever so increasing. As they began to say their farewells, they cursed the world and wondered why they had to be separated, why their love for each other could not have been maintained. But unfortunately, the chasm and the world does not suit what they want, and they were forever destined to be apart, no matter how close they may have seemed to be. Although they may be separated now, they will always remember the times they were together as two mountains, and they will never forget each other in their minds.

Supplementary Figure 1. The 24 comics used in the study.

Supplementary Table 1. The LIWC word lists used in the study. The negative controls: *future focus* (LIWC list 92), *cause* (LIWC list 52), and *prep* (LIWC list 11). The word lists of interest: *she/he* (LIWC list 7 with slight modifications by us), *it* (the set of eight it-related words from LIWC list 9, *IPron*), *social* (LIWC list 92 with slight modifications by us), and *achieve* (LIWC list 82).