Closure Through an Ontological Lens

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Abstract

Narrative identity refers to the internalized and temporally structured life story individuals or narrative agents develop over time. Narrative themes emerge as recurring pattern within and across such narrative processes that are believed to reflect broader conceptual meanings embedded in the stories of narrative agents. In this paper, we propose a research effort in the ontological foundations for a specific narrative theme: closure, the degree to which the narrative agent has come to terms with and moved beyond past adversities, as opposed to remaining fixated on them and past regrets. Providing a robust ontological characterization of closure is important, given its prevalence in highly self-transcendent narratives. We choose to leverage the Basic Formal Ontology and its extensions to model relevant narrative elements that comprise closure. Our efforts led to the development of the Closure Design Pattern, a model of a narrative agent partaking in several processes that represent how they may show signs of closure whilst narrating their life story. By representing closure as a disposition and modeling its relationship other narrative elements, we hope to eventually clarify ambiguities in narrative identity research.

Keywords

Narrative Identity, Closure, Applied Ontology, Narrative Agent, Common Core Ontologies

1. Introduction and Background

1.1. Aging Research and Applied Ontology

The average human life expectancy has been increasing over time, and more people are expected to reach "old age" on a global scale. According to the World Health Organization, by 2030, 1 in 6 people globally will be aged 60 or older. By 2050, the number of people in this age group is expected to rise from 1.4 billion to 2.1 billion [1]. Additionally, the population aged 80 and above is projected to reach 426 million by 2050. The increase in human life expectancy can be attributed to advancements in medicine, improved access to food, and better hygiene [1]. As a result, aging and reaching old age has become a widespread human experience. While this demographic shift presents a success in human advancements, it also brings new challenges. In response, researchers across various disciplines are increasingly focused on what it means to age successfully, exploring the physical, psychological, and social factors that promote health, independence, and well-being in later life. Many disciplines are tackling this issue using distinct perspectives and approaches [1], but in doing so, leave it open for these disciplines to end up missing each other's points. It is also important to translate findings for the purpose of advancing research. We have decided to pursue the narrative identity framework because it has recently been used to study personality development among older adults in hopes of finding key insights into how adults who experience psychological well-being tend to view their lives and make meaning of them. We are particularly interested in Self-transcendent narratives that depict closure given this is a territory that even in narrative identity circles has been largely untouched.

Therefore, it is quite relevant to translate these findings into a more universal lexicon so that other disciplines can benefit from these insights. This is why we are taking an applied ontological

approach to this issue. Applied Ontology uses metaphysical principles and logical theories to form a shared vocabulary to ensure interoperability between data sets [2]. In this paper we propose a way to map narrative identity, specifically the psychological construct of closure. To do so we will need a systematized way of tackling this problem. To meet this end, we will be grounding our model in the Basic Formal Ontology [2, 3] and Common Core Ontologies (CCO) [4, 5].

1.2. Narrative Identity and Self-Transcendence

Researchers have taken an interest in the narrative identity framework because the approach allows for capturing and analyzing phenomenological events and experiences occurring through narrations that provide insight into how narrative agents shape their identities. The framework views human beings as narrative agents who construct meaning through autobiographical storytelling [6]. Narrative identity is a term used in reference to the internalized and temporally structured life story or narrative that narrative agents develop over time [6]. Narrative agents develop their life stories through the integration of reconstructed past experiences and imagined future trajectories which in return allows them to cultivate a sense of coherence and purpose to the self. Viewed from an ontological lens, narrative identity can be considered a dynamic configuration of events, states, and intentions all occurring within a lived temporal framework. From these narratives, Themes emerge as recurring patterns from the agent's narrative that reflect broader conceptual meanings embedded in their personal stories.

There has been a call for researchers to use narrative identity to determine causal relations between narrative themes and human flourishing, as well as exploring narrative identity in broader cultural contexts [6]. Responding to this call, researchers are presently exploring how the narrative identity framework can be applied to study dimensions of psychological well-being like self-transcendence and the feeling of being connected to something greater than oneself [7]. The reason why self-transcendence has become a topic of interest among psychologists is because it is positively correlated with human flourishing and well-being, and negatively correlated with neuroticism and depression [7, 8, 9]. Developing a better understanding of how people come to be self-transcendent can lead to the development of possible psychological interventions to cultivate this feeling in individuals and therefore help increase their levels of psychological well-being, which makes it a relevant topic in the psychology field.

1.3. Self-Transcendence and Closure

Furthermore, self-transcendence is a quality that has traditionally been assessed through self-report measures. Given the limitations of self-report measures, such as social desirability bias and lack of contextual details, researchers are now exploring self-transcendence through the analysis of personal narratives, providing a more phenomenological understanding of how narrative agents experience and make meaning of their lives. Present research on self-transcendence within the narrative identity framework has established several recurring narrative themes that emerge from the narrative of agents who are highly self-transcendent [7]. One theme of particular interest is closure, the degree to which the narrative agent has come to terms with and moved beyond past regrets, as opposed to remaining fixated on them [7]. Self-transcendent narrative agents tend to display a sense of closure when narrating their past difficult experiences and either hold a few regrets or none. In the cases where narrative agents mention their regrets, they narrate them with a deep sense of acceptance and overall recognize there was no other way for their life events to unfold exactly the way they did. On the contrary, narrative agents who do not exhibit self-transcendent traits tend to lack closure as a theme in their narratives. Their regrets seem to cloud their present judgements, and they are still holding onto the past. Furthermore, simply accepting regrets is not enough to achieve closure and can instead be considered a form of coping, a combination of cognitive and behavioral techniques that a narrative agent practices to overcome an overwhelming or stressful situation, with the goal of minimizing emotional strain [10]. In the specific case we are referring to, coping strategies may be used by the narrative agent while they are narrating to minimize the emotional strains that come with experiencing regret. Coping does not signify closure because the narrative agent still narrates their regrets in a way where said regrets are

clouding their narrative and therefore their own personal judgement in the present, indicating that they have not truly overcome their regrets. To summarize, the attempt to overcome regrets may be mistaken for closure when it is coping, and that can be determined by whether the narrative agent is able to overcome said regrets while narrating.

2. An Overview of Closure Through an Ontological Lens

By creating a model of closure, we hope to clarify and refine the psychological construct and its relation to the overall topic of narrative identity. We are deciding to focus on closure because it is arguably one of the most important psychological constructs in narrative identity research; it represents the resolution to one's narrative. While closure has traditionally been treated as a literary or psychological endpoint, we propose that it is more productively viewed as a complex process. We believe BFO would allow us to categorize these elements as occurrents, continuants, and dependent continuants, offering a more structured way to understand how closure operates within the ontology of narrative identity. By representing closure as a process rather than a fixed outcome, we aim to develop a richer conceptual framework for analyzing narrative themes. This is of importance because researchers need methods and tools for further exploring the role of broad cultural contexts and how they shape narratives [6]. Moreover, closure is a subjective experience and there are numerous paths and interpretations of what closure is and how narrative agents may go on about achieving closure, but all these routes and interpretations can be drawn back to the same origin and simple process which is what we are trying to map out.

CCO and its extension of BFO allows for a precise characterization of closure and its related and intertwined psychological processes. By representing the Narrative Agent as taking part in processes we take adequate distance from traditional and, as we propose, outdated, interpretation of closure as a psychological endpoint. By representing the agent as taking part of the process of building a narrative, which is then extended to the process of gaining narrative closure, and potentially the extent of facing a disruptor process of said closure, namely, regretful thought, we are able to show the relevant considerations and cognitive actions of narrative agents who narrate their own lives and reach or do not reach closure. By linking each of those processes together with the process part, interpretation process, we are able to show that the agent is going through multiple steps of cognitive activity to potentially reach narrative closure, or on the other chance, fail to reach it by showing regretful sentiment, which is represented as a separate process in our design pattern. The narrative agent is also essentially shown to be linked to the biographical life of the agent, to represent how narrative building is based on recalling the history of one's past. Like the interpretation process, the agent's life, characterized as a subclass of an act, gives context to the source of the narrative building of the agent and provides another link between the processes of the design pattern. Together, the interpretation process and the agent's life act as a web to represent what the other processes are about, and where they are taking place, a narrative being built about one's life, and processes surrounding closure that are internally achieved. The narrative building process is the act of the agent narrating their own life, and the remaining processes, gain of narrative closure and regretful thought, show the agent's reaction once building a narrative. For the agent to begin gaining narrative closure, or the disruption of regret, which are both represented through their corresponding dispositions, where the agent has closure or regret. In this example, the narrative agent only bears the regretful sentiment, and not the disposition of narrative closure, to represent how an agent would fail to gain closure because of taking part in the process of having regretful thought. This design pattern is an initial attempt at characterizing the research above but has much potential to be improved.
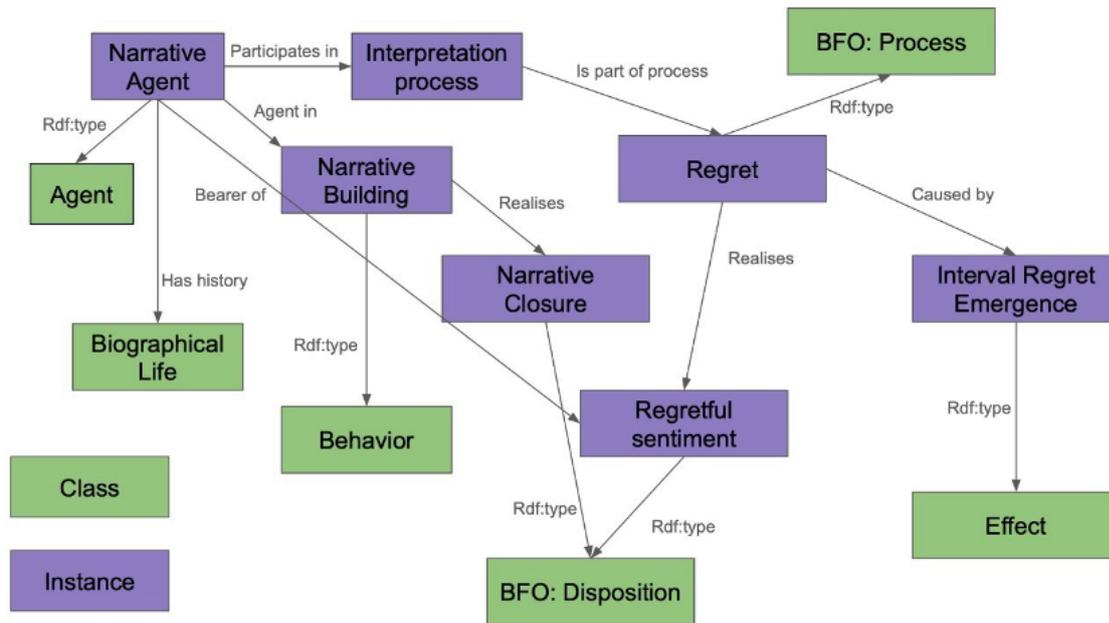
Figure 1: Design Pattern Closure

3. Methods

3.1. Frameworks

As outlined above, The BFO is one of the most commonly used ontological frameworks [2]. It is an upper-level framework that is used to integrate and structure ontologies of various domains, representing terms and relations at their most generic level. The CCO is a suite of 11 ontologies that extend from BFO [4]. They follow a mid-level architecture; this means they are generic enough to not be domain specific but not as abstract as BFO. Here we have been able to put together a rudimentary characterization of closure and its disambiguation from coping through the use of CCO because of its functionality and intelligible level semantics. CCO is built in accordance with BFO. In future updates in our progress, we recognize that the Mental Functioning Ontology (MFO) [11] will be a vital Ontology in improving our characterizations of Closure and adjacent elements and so will be used in future versions.

3.2. Design Patterns

Our model for closure is represented via a design pattern, not a full knowledge graph. Design patterns are a concentrated representation of an Ontology, its main purpose is to show the logical structure between its elements. They are also used for the purpose of allowing subject matter experts and relevant audiences to understand what an Ontology and its data is answering without needing to comprehend all its technical parts.

In our design pattern below, instances are represented in purple rectangles, while classes are represented in green rectangles. Using protege version 5.6.5, we were able to access key terminology and the massive bank of information that lies within CCO. Using the Mermaid flavor of Markdown, we have been able to create a visual representation of how closure and its related concepts can be characterized through ontologies in a way that helps to disambiguate various relevant elements. For example, between coping and closure, or the difference between closure and regret, as per the definition of coping we have chosen to use.

Since the Closure Design Pattern we have built is sourced from CCO Version 2.0 [5], this makes the design pattern entirely BFO conformant. The design pattern is focused on representing key concepts of

self transcendence and closure and as done so largely with various processes, dispositions, and object properties/relations. All classes, distinguished in green boxes, are directly pulled from CCO giving them refined and agreed upon definitions. All instances, distinguished in purple boxes, are proposed novel contributions that we have created and curtailed for our applications on Narrative Identity. We have created this design pattern with the purpose of describing the particular circumstance given in the model, but our proposed instances could work as their own classes just as effectively if they were to have the instances we have represented above. We have chosen to represent our contributions as instances in this model as it would more clearly connect to their CCO predecessors, and make a more visibly digestible model for the audience. One of the pillars of our design pattern is the use of dispositions to characterize certain mental states, in particular, 'Narrative Closure', and 'Regretful Sentiment'. Dispositions are subclasses of realizable entities, where it functions as a part of a continuant, for our purpose the Narrative Agent.

The Design Pattern portrays the agent as the bearer of these dispositions that are realized from the corresponding processes and shows that the agent can experience these processes with different outcomes of dispositions realized in the agent. The Closure Design Pattern shows that the agent was partaking in the process of 'Narrative Building', which leads to the disposition of 'Narrative Closure, but before the disposition of 'Narrative Closure' is gained by the Agent, that process is disrupted. Having the Agent represented as partaking in the process of 'Narrative Building', we also show them partaking in the subsequent disruptor process of 'Regret', which realizes the disposition of 'Regretful Sentiment' (thus preventing the realization of the disposition of 'Narrative Closure'), and stems from the process/effect of 'Interval of Regret Emergence'. To clarify, the Agent may partake in both processes of 'Narrative Building' and 'Regret' because the former represents the narration of one's life, while the later is a representation of what can be a coexisting process because it represents someone inhabiting regretful thought, which can easily exist during the narration of one's life. Alternatively, the dispositions of 'Narrative Closure' and 'Regretful Sentiment' cannot coexist, because the later disposition inherently implies that the former disposition has not been realized, so to say there is no full closure with there being regret. The Interval of Regret Emergence is uniquely delineated in green, despite being an instance as the shape implies, we decided to make it green as a visual stimulant for observers, to show how the disposition of regret essentially spawns from the narration of some period in time of the past where the agent wishes things went differently, and is demarcated as a process to show how the narration about this period of time can be recognized in an agent as coping as we have here, or could alternatively be recognized as narrative agent, which our example agent does not bear. Narrative Building, Gain Narrative Closure, and Regretful Thought are all processes we have characterized by behaviors, which is a subclass of acts, which for our purposes is some kind of process with some kind of internal stimulus to start things. There is an exception with Interval of Regret Emergence described as an effect, which is a process started by another process. This is an accurate description, but to be transparent we could easily have called that behavior or just a general process, or as the MFO would have it, a mental process. See table below for working definitions of italicized terms in this section.[1]

4. Conclusion

We leveraged the Basic Formal Ontology and its extensions to model relevant narrative elements that comprise the narrative theme closure. Our efforts led to the development of the Closure Design Pattern which displays a model of a narrative agent partaking in several processes that represent how said agent may demonstrate signs of closure whilst narrating their life story. During our model construction we made precise efforts to build, the historic context, and cognitive interpretation that all narrative agents would partake in this process. We think that our model successfully lays the foundation for modeling the narrative theme closure as we choose to frame the theme as a disposition to clearly indicate its relations to other narrative elements. While we suggest the design pattern effectively models closure,

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[1]The table below has been formatted to clarify unfamiliar terms, which were drawn from past literature on the Narrative Identity Framework and combined with CCO terminology to develop the closure design pattern shown in Figure 1

Table 1
Key Terms and Definitions

Term	Definition
Narrative Identity	The internalized and temporally structured life story or narrative that narrative agents develop over time [6].
Narrative	The spoken or written account of the narrative agent's life story [6].
Narrative Agent	The individual narrating their own life story.
Theme	Recurring patterns from the agent's narrative that reflect broader conceptual meanings embedded in their personal stories.
Narrative Building	The act of constructing a narrative.
Self-transcendence	The feeling of being connected to something greater than oneself [7].
Narrative Closure	A narrative theme that emerges from the narratives of self-transcendent individuals. Closure signifies the degree to which the narrative agent has come to terms with and moved beyond past regrets, as opposed to remaining fixated on them [7].
Gain of Narrative Closure	The act of gaining closure. Closure is gained when the narrative agent does not express regretful sentiment, or recognizes regretful sentiment but narrates with a tone of acceptance, indicating that the regretful sentiment does not cloud their present judgment [7].
Coping	A combination of cognitive and behavioral techniques that a narrative agent may use in an attempt to overcome an overwhelming or stressful situation, with the goal of minimizing emotional strain [10].
Regretful Event	An event that may produce regretful sentiment depending on how the narrative agent narrates and perceives the event.
Regretful Sentiment	Referring to the disposition of feeling regret, realized in the agent through the aforementioned Gain of Narrative Closure.
Regretful Thought	The name of the process which disrupts the gain of narrative closure; a characterization of the process in an individual that realizes the disposition of regretful sentiment.
Interval of Regret Emergence	The process of a Narrative Agent recalling a Regretful Event, which may realize the disposition of a Regretful Sentiment within that agent.
Interpretation Process	The process describing the Narrative Agent's mental reaction and outcome of taking part in other processes such as Gain of Narrative Closure and Regretful Thought.

we also acknowledge that further refinement is needed, and our work is not an exhaustive account of closure or narrative identity. Our future endeavors include expanding to model more narrative elements of narrative identity in hopes of creating an overall ontology of narrative identity.

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Declaration on Generative AI

During the preparation of this work, the author(s) used ChatGPT to check grammar and spelling, paraphrase and reword. The author(s) reviewed and edited the content as needed and take full responsibility

for the publication's content.

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