INTO THE RAINY WOODS

Project to Universidade Católica Portuguesa to obtain a Master's Degree in Communication Sciences

By

Julia Kausch

Universidade Católica Portuguesa

September 2022

UNIVERSIDADE CATÓLICA PORTUGUESA

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Abstract

Into the Rainy Woods aims to use concepts of storytelling in an outline for a immersive, augmented walk through the rainforest to break with current narratives surrounding the topic of climate change and to create an emotional proximity with and empathy for the destruction of the rainforest. Based on Campbell's (1949) *Hero's Journey*, I have conceptualized *A Journey of the Virtual Hero*, one that is based on an immersive experience, with a possibility to get lost in the woods, posing open-ended questions. The project is based on the argument that creating proximity with issues surrounding the Amazon rainforest using both storytelling and discourse, allows for agency through the performative act of clicking and/or walking through a virtual space, both of which facilitate empathy.

The website is available under: www.intotherainywoods.com

Keywords: Rainforest, storytelling, discourse, empathy studies, contact hypothesis, immersion, augmented reality

Resumo

Into the Rainy Woods visa usar conceitos de narrativa em um esboço para uma caminhada imersiva e ampliada pela floresta tropical para romper com as narrativas atuais sobre o tema da mudança climática e criar uma proximidade emocional e empatia pela destruição da floresta tropical. Com base em A Jornada do Herói de Campbell (1949), conceituei A Jornada do Herói Virtual, que se baseia em uma experiência imersiva, com possibilidade de se perder na floresta, colocando questões abertas. O projeto argumenta que criar proximidade com questões que cercam a floresta amazônica usando narrativas e discursos ambientados virtualmente, permitindo agenciamento por meio do ato performativo de clicar e/ou caminhar por um espaço virtual, que, combinado com a hipótese de contato, cria a empatia.

O site está disponível em: www.intotherainywoods.com

Palavras-chave: Floresta tropical, narrativa, discurso, estudos de empatia, hipótese de contato, imersão, realidade aumentada

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1. Introduction

The woods are lovely, dark and deep,
But I have promises to keep,
And miles to go before I sleep,
And miles to go before I sleep.
- Robert Frost (1972, p. 24)

Figure 1: *Jungle Memory* 0001, image created with an AI trained on many thousands of forest images, programmed by Daan Lockhorst, Andreas Greiner (Greiner, 2019)[1]

Once upon a time: the beginning of any good children's story, a phrase that indicates to the reader or listener that a fairy tale will follow: a fairy tale whose gloomy setting frequently includes the woods, in which the reader (or listener) can get lost, as the woods are home to things of dreams and nightmares: witches, wolves, burglars, or wicked cats. For *Jungle Memory* (figure 1), an AI was trained to collect imagery of the jungle and combine it in a new work that is drawing from memories of all the other jungles. This discursive assemblage has been a guiding idea for *Into the Rainy Woods*, in which memories (i.e. stories in videos, texts, and audio narrations) come together and form something new that is bigger than its individual parts. However, each of these individual parts provides a new nuance. Similarly, each story told in *Into the Rainy Woods* offers a different perspective.

[1] Daan Lockhorst was initially supposed to be in charge of post-production, but due to other obligations, the collaboration did not come about.

Umberto Eco, whose lectures from *Six Walks in the Fictional Woods* (1998) form the basis of this project, writes: "'Once upon a time,' [conveyed in the imperfect in Italian] … immediately enables it to select its own model reader, who must be a child, or at least somebody willing to accept something that goes beyond the commonsensical and reasonable" (p. 9). How we tell a story not only selects the audience, but also indicates how it will be perceived. This project chooses an audience of all ages, cultural backgrounds, and social standings.[2]

Once upon a time, there was a forest that was so vast it is considered the 'lungs of the world,' substantially contributing to the quality of air around the globe:

> The Amazon rainforest has long been recognized as a repository of ecological services not only for local tribes and communities, but also for the rest of the world. It is also the only rainforest that we have left in terms of size and diversity (Why is the Amazon rainforest important?, n.d.).

Yet, studies show that this repository of ecological service is losing its resilience (cf. Boulton et al., 2022).

Increased deforestation causes edge effects such as "elevated tree mortality," which is correlated with more trees dying due to changes in the microclimate, a loss of habitat and extinction of species diversity, as well as further driving anthropogenic climate change (Laurance et al., 2002). As figure 2 highlights, the edge effects trickle through many layers of the forests and cause ripple effects that further amplify the impacts of deforestation.

[2] Any account given, and narration told will always include my own Eurocentric perspective. I have tried to let the people speak for themselves, whenever possible. However, a Eurocentric positioning due to my own cultural background cannot be negated.

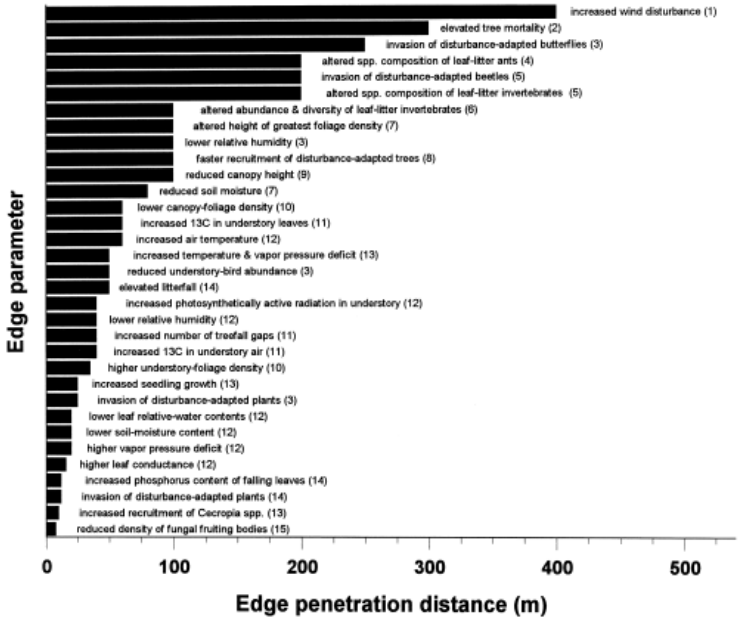

Figure 2: Penetration distances of different edge effects into the forest remnants of the Biological Dynamics of Forest Fragments Project (Laurance et al., 2002).

Of course, the rainforest is not a fictional place, but its representation is often abstracted and does not always achieve the creation of empathy. This is especially true for nonnarrative news stories (cf. Oliver et al., 2012). Yet empathy is a key factor when it comes to engage people with matters like deforestation and the global in order to initiate change or a global movement to protect the environment (cf. Farkas, 1982). Media coverage that is often focused on global impacts of deforestation and wildfires (cf. Fearnside, 2005) leave the media consumer in a short-lived state of despair, which quickly fades into the background of the daily media buzz – and in the worst case leads to informational apathy (cf. Paluck, 2017). Regarding this phenomenon, Boje (2019) states "we descend into fake news, fake discourse, and meaninglessness. We become like the wisdomless lemmings following one another over the cliff" (p. 336). Misinformation regarding deforestation is prevalent especially in Brazilian news and the Global South (cf. Rajão et al., 2022).

While most international, and especially Western[3] news coverage describes the issues for the most part factually (cf. Mempel & Bidone, 2022), the lack of ability to create empathy as well as the "NIMBY Syndrome" (Not-in-my-back-yard syndrome), result in inaction (Farkas, 1982). A lack of proximity and personal relationship to the place can, thus, result in a shoulder shrug when it comes to the complex issues surrounding the destruction of the rainforest. Policies, a lack of enforcement, and corruption are opaque to those spectators who do not live in the area (i.e., Brazil and the other eight countries this vast forest stretches across). I use the term *spectators* deliberately to emphasize that, on a global scale, the rainforest is a stage on which world politics play out. Figure 3 outlines the most prominent topics over the last 10 years that resulted from a study conducted by Mempel and Bidone (2022) and the domination of negative, environmental news.

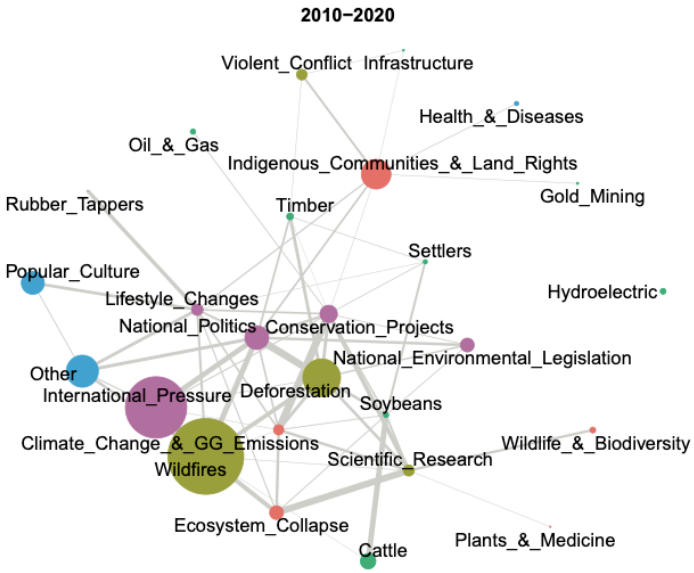

Figure 3: Topic co-occurrence networks for articles on the amazon biome. Nodes are colored according to topic category. Only the upper 25 percentile of edges is plotted (Mempel & Bidone, 2022, p.8).

Regarding this virtual media stage, Boje (2019) notes that, "storytelling organization has completely morphed, and has transformed sensemaking into the 'virtual organization'" (p. 336). Drawing from storytelling theories from Gertrude Stein, Walter Benjamin, and Linda Smith, Boje

[3] Any reference I make to Western culture refers to a Eurocentric and/or northern American cultural background, through "the adoption of the practices and culture of western Europe by societies and countries in other parts of the world, whether through compulsion or influence" (Britannica, 2022).

(2019) concludes that storytelling has largely been displaced by discourse – a trend he attributes to the advancing digitization, and which started with the invention of the printing press. But why are these perceived as diametral opposites? Can the two – storytelling and discourse – not be combined, be constitutive of one another?

Discourse "can be understood to mean ways of speaking which are commonly practiced and specifically situated in a social environment" (Rapport & Overing, 2000, p. 177). Michel Foucault (2002) outlined an understanding of discourse that links "forms of communication, knowledge and power… [while] cultural discourses maintained both conventional ways of knowing the world and a network of power relations among those who did the knowing" (Rapport & Overing, 2000, pp. 119-120). Thus, discourse always entails elements of power: who is speaking about what and whom?

Regarding storytelling, Boje (2019) states it "addresses the 'why-question'… giving an account of cause" (p. 339). That very personal, lived experience is what is lacking from most discourse, but it is an important aspect for creating empathy (cf. Zaki, 2020). Hence, storytelling gives more personal narratives that are more susceptible to empathy. Because spectators cannot relate to the rainforest on a personal level, they struggle to empathize (cf. Brosch, 2021). Studies that tie empathy to climate change through a focus on public health rather than environmental factors, point to the fact that current narratives surrounding the global climate crisis (and by extension the Amazon rainforest) lack relatability (cf. Limaye, 2021; cf. Brosch, 2021). Jamil Zaki (2020), associate professor of psychology at Stanford University, argues that, even though empathy towards the environment is prevalent, it is often directed at our own culture.

Consistent with this idea, spectators have no role to play in the story about the Amazon rainforest. Looking at Walter Benjamin (1969), storytelling offers a solution through more personal accounts that are not about sharing information, but rather sharing one's experience (cf. p. 87). Drawing from Boje (2019), I aim to incorporate both storytelling and discourse in this project in a manner that they constitute one another rather than are diametrically opposed.

The project I have created, *Into the Rainy Woods*, is a website that uses storytelling and narration to create an immersive, augmented walk through the rainforest to allow for an emotional proximity with the rainforest, and empathy for its destruction. This story, by design, is nonlinear, ambiguous, and offers different points of view. Based on Campbell's (1949) *Hero's Journey*, I have conceptualized *A Journey of the Virtual Hero(ine)*, one that is immersive, with a possibility to get lost in the woods – or a virtual loop, posing questions such as, what if there is no resolution? What if you get lost in the woods? What if anyone could become the hero(ine) of the story?

2. Literature Review

Stories make a culture, a place, a people. Their collective memory and identity, their shared history and sense of belonging, their joy and pain, their losses and gains all contribute to the formation of culture (cf. Keen, 2006). Culture can be understood as a net whose knots, the points at which things meet and intertwine, form the most interesting components (cf. Miller, 2016). It is here that things come together, collide, and break. Like this net metaphor, I would like to invoke a ginger root growing in a rhizomatic shape. There is no beginning or end – no hierarchy. Deleuze and Guattari (1987) also chose the rhizome as the basis for their philosophy. As Halsey (2007) writes,

> Gilles Deleuze and Félix Guattari are opposed to trees. Specifically, they position themselves against arborescent thought—thought, which like a tree, judges the world from one fixed point (roots, Descartean rationality), or requires that thinking proceed in only one direction (scientifically, dialectically).

Interestingly, this very arborescent thought-structure can only be applied when looking at a single tree. It crumbles when you look at the forest as a whole. "The rhizome [and the forest] is an anti-genealogy" (Deleuze & Guattari, 1987, p. 11). Looking at a forest, it is striking that what is apparent is not the single tree, but the group of trees that form the woods, shading the walker from the sunlight. Thus, the metaphor of the forest can be looked at not as looking down on the world or following a one-directional growth pattern of roots, but as creating a microcosm, into which people can immerse themselves.

This brings me back to Eco (1998), who notes that each story is like a walk through the woods, on which one can either walk on the main path or leave it behind, walk around a single tree and look at it more closely. Interestingly, the woods are of great importance in many cultures. What is not obvious at first glance, however, is that each tree is interconnected under the surface, as Suzanne Simard, professor of forestry at the University of British Columbia, points out.

Figure 4: Suzanne Simard, University of British Columbia How trees talk to each other (Staff, 2017).

According to Simard (2017), trees communicate like a brain, sending signals through the use of fungi (figure 4). This suggests that a forest works as an entity, rather than an accumulation of trees (Staff, 2017). On a conceptual level, this helped shape the framework for this project, which follows this rhizomatic root system telling different stories. Instead of discourse versus storytelling, stories, images, sounds, interviews, videos, and anecdotes will form a discourse in and of itself. This multimedia-format further enables storytelling from multiple perspectives, nonlinear, and fragmented. For a more in-depth analysis of discourse and storytelling, Walter Benjamin, Judith Butler, and Roger Sale are of importance.

2.1 Contact Hypothesis

To get a better understanding of empathy and what makes humans engage with certain issues more than with others, empathy studies as well as the contact hypothesis are considered, the latter of which goes back to Gordon Allport (1958). McKenna and Hamburger (2006) define it as follows: "According to this theory, contact under certain conditions, such as equal status, cooperation towards a superordinate goal and institutional support, will create a positive intergroup encounter, which, in turn, will bring about an improvement in intergroup relations" (p. 825). Studies in the

field of the contact hypothesis range from prejudice towards the elderly (cf. Caspi, 1984), racial implications (Braddock, 1980), stigma attached to HIV/Aids (cf. Werth & Lord, 1992) to interracial roommate arrangements (cf. Shook & Fazio, 2008). A meta-analysis conducted by Pettigrew and Tropp (2008) looked at the effects of the reduction of prejudice through intergroup contact. In it, they come to the conclusion that intergroup contact not only increases empathy, but also increases knowledge while reducing anxiety towards the other group.

Applying this hypothesis to a place so vast, culturally different, and by no means of equal status, could be considered a stretch. How can the contact hypothesis be applied to the Amazon rainforest and this project in particular? As Grim et al. (2005) point out, there is "a set of conditions: the contact at issue must be carried out by participants of equal status, who share common goals, participate in inter-group cooperation, and receive the support of authorities" (p. 96). Especially the constitution of equal status becomes a problem. However, the Internet and virtual spaces have shown to improve interactions towards making them more equitable: A study conducted by Wohjan (1994) points to more gender equality on Internet boards, while Ward (1997) ascribes a limited democratization in public discourse, as does Friedman (2005) with regards to minorities:

> [It] has the potential to enable, and in some cases already is enabling, people of increasingly diverse backgrounds to find representation in the sector. For this development to continue, organizations must marshal their resources so that meaningful access to cyberspace extends to more than a small minority. Second, the technology allows advocates to disseminate their ideas widely (p. 25).

If, for the purposes of this project, equal status is achieved through the use of a virtual space, in which equality can (at least to a certain degree) be accounted for, contact hypothesis applies. The-subordinate goal, in turn, also implies a certain 'model reader' who shows an interest in protecting the environment. All participants as well as the elements of the story are of equal status, despite differences in format, length, and message. The stories themselves become the central aspects of the greater discourse that allows for contact of individuals of different status *through* them.

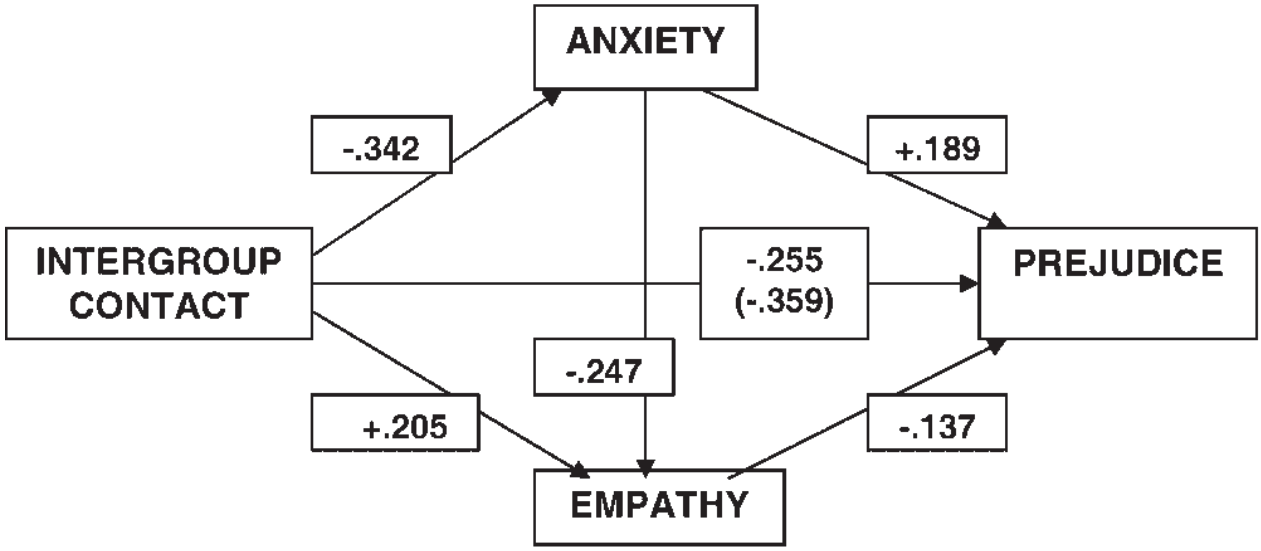

Figure 5: Saturated path model of mediation of the contact-prejudice association by anxiety reduction and empathy for nine samples with all four variables. All paths are standardized betas and statistically significant at $p < .001$ (Pettigrew & Tropp, 2008, p. 928)

Pettigrew and Tropp (2008) assert that, through intergroup contact, prejudice and anxiety can be reduced, while empathy is strengthened. Their findings point to the employment of the contact hypothesis in new ways, i.e., less rigid settings that do not follow the original definition of the contact hypothesis and offer new opportunities to overcome prejudice through perspective taking, while strengthening intergroup contact. As mentioned previously, the aim, then, is to create empathy, a concept that is key to any societal issue and was first discussed in the 19th century (Riess, 2017).

2.2 Empathy Studies

From a young age, humans learn how to read and mimic emotions through facial expressions, gestures, and more involuntary expressions like crying (cf. J. Butler 1997; cf. Riess, 2017). "When individuals empathize, they vicariously feel the emotions of others, which not only promote affective communication but depending on the context and social relationships may motivate to behave pro-socially towards other conspecifics," Decey et al. (2012) write (p. 38). Through empathy and mimesis, these expressions are internalized. Keen (2006) defines empathy as follows:

> Empathy, a vicarious, spontaneous sharing of affect, can be provoked by witnessing another's emotional state, by hearing about another's condition, or even by reading. Mirroring

> what a person might be expected to feel in that condition or context, empathy is thought to be a precursor to its semantic close relative, sympathy (p. 208).

Notably, there is a stark difference between empathy and sympathy, in which empathy is favorable over sympathy when dealing with issues of global magnitude.

"**Empathy:**	**Sympathy:**
I feel what you feel	I feel a supportive emotion about your feeling" (Keen, 2006, p. 209).

Looking at "Empathic Failures," Zaki and Cikara (2015) describe empathy as "a multidimensional construct comprising several cognitive and affective processes" (p. 472). This distinction is interesting and important when looking at manners in which empathy can be produced. Zaki et al. (2008) differentiate between affective empathy and cognitive empathy, the first of which they define as a perceived and shared emotion whereas cognitive empathy entails a deeper understanding of person's emotions (p. 399):

> Although it is a useful overarching term, 'empathy' refers to a suite of related but distinct phenomena. These include mentalizing, or inferring others' mental states; experience sharing, or vicariously taking on others' internal states; and compassion, or feeling concern for others' well-being (Zaki et al, 2008, p. 472).

Empathy can be measured using different tests such as self-reports through questionnaires, which measures affective empathy, and the use of an fMRI, which can show cognitive empathy that "occur[s] through interactions between limbic and cognitive structures" (Decey et al., 2012, p.40).

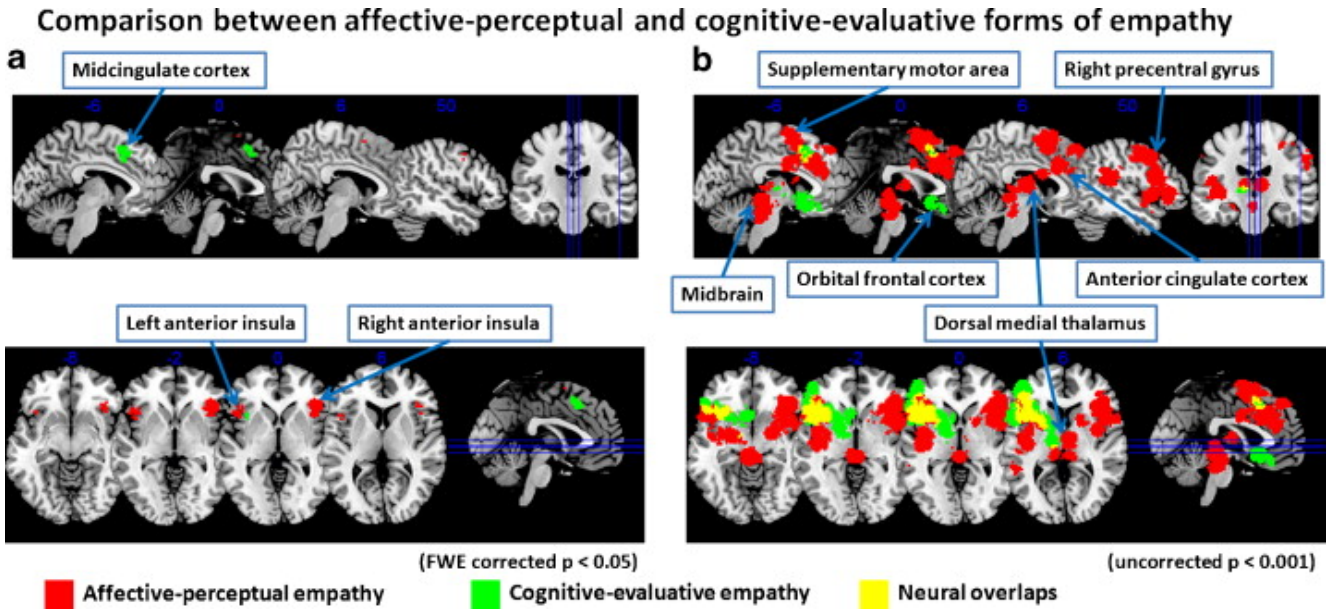

Figure 6: "Comparison between brain regions consistently activated in the affective–perceptual (red colour in a and b) and the cognitive–evaluative forms of empathy (green colour in a and b), with threshold level at (a) FWE corrected $p < 0.05$ and (b) $p < 0.001$ uncorrected, respectively. Neural overlapping regions were shown in yellow colour. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of the article" (Fan et al., 2011, p. 907).

As figure 6 shows, empathy as perceived and empathy that is felt have different impacts. While perceived, i.e. affective empathy should not be dismissed, it is cognitive empathy that is deeply impactful. Especially with regards to pressing issues such as the destruction of the Amazon rainforest, the causality between empathy and action (as opposed to just attitudes) is noteworthy (cf. Eisenberg & Miller, 1987): "Empathy affects action as well as attitudes," Batson et al. (2002, p. 1665) write.

In the face of natural disasters such as the climate crisis, Zaki (2020) notes that "individuals (i) panic, (ii) ignore social order, and (iii) act selfishly" (pp. 587-588). Especially in Western societies, Drury (2018) notes, people are more prone to acting in their own self-interest – which correlates

with Hofstede's (1980) model of cultural dimensions of individualistic versus more collective cultures.[4] However, as a study conducted by Drury et al. (2013) points out, these "disaster myths" are cultural constructs (p. 2259). "When people believe others will 'go rogue' following disasters, they are expressing one flavor of a more general, dim view of their fellow citizens" (Zaki, 2020, p. 589). The result, Zaki and Cikara (2015) call "[e]mpathic failures [which]… arise in more quotidian settings – for instance, when people fail to understand the emotions of other-race targets" (p. 471). This is interesting especially with regards to multinational studies on empathy that point to difficulties in creating empathy across cultures (cf. Birkett, 2013; cf. Draguns, 2007). Riess (2017) notes: "People are evolutionarily wired to recognize and respond to differences and socially or culturally based perceptions can trigger subconscious fears that threaten emotional homeostasis" (p. 75). How, then, can these differences be bridged? Regarding parties with differing status Zaki and Cikara (2015) note: "Interventions … should expand their focus on cultivating empathy and positive regard to include an emphasis on building conditions that recognize asymmetries between parties and foster equitable norms and behavior" (p. 472).

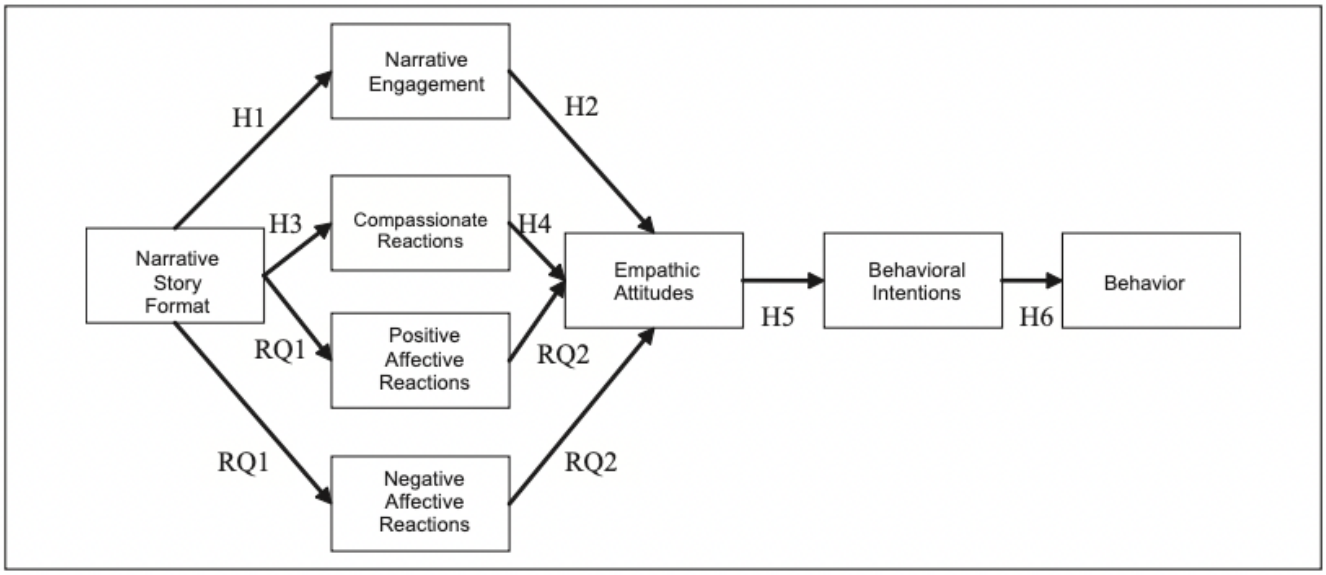

Figure 7: Hypothesized model (Oliver et al., 2012, p. 206).

[4] As scholars have pointed out, the Hofstede and GLOBE models oversimplify cultural differences and nuances (cf. Venaik & Brewer, 2013; cf. Beugelsdijk & Welzel, 2018). However, for the purposes of this project, Hofstede's (2011) general spectrum is sufficient to understand social drivers in different societies. A detailed analysis of effects of empathy studies regarding different social dimensions could be included in future studies on the impact of this project.

Scholars point to the effectiveness of narratives with regards to bridging these cultural differences. As Ansbach (2012) argues regarding the effects of empathy towards victims of bullying, nonfiction essays can benefit affective empathy in a way that "students will feel what the victims and bystanders felt" (p. 89). Oliver et al. (2012) substantiate this ascription of empathy to narrative storytelling and behavioral changes (figure 7), as "researchers are beginning to recognize the importance of format in affecting not only engagement with information, but also the extent to which attitudes and beliefs are changed by information that is presented or implied by the story" (p. 205-206). Further, Keen (2006) ascribes a production of empathy to reading:

> Memory, experience, and the capacity to take another's perspective (all matters traditionally considered cognitive) have roles in empathy. Yet the experience of empathy in the feeling subject involves the emotions, including sensations in the body. In any case, narrative empathy invoked by reading must involve cognition, for reading itself relies upon complex cognitive operations.

Keen (2006), of course, is talking about fictional narratives. While empathy invoked by oral histories as well as physical representation is of the performative kind, the "narrative empathy invoked by reading must involve cognition, for reading itself relies upon complex cognitive operations. Yet overall, emotional response to reading is the more neglected aspect of what literary cognitivists refer to under the umbrella term cognition" (Keen, 2006, p. 213). Reading and listening to stories, as opposed to seeing them in a play or on TV, require a great deal of imagination. "[S]uch empathy certainly deserves the label cognitive, but the sensations, however strange, deserve to be registered as feelings" (Keen, 2006, p. 213). Empathy – positive or negative – can, thus, be brought on by any reading (or media consumption). Regarding oral histories, Bennet (1983) notes that "one reason oral histories are so good at representing human values is that human value is not an abstraction – or rather, it becomes such only in analysis" (p. 3). Similarly, Benjamin (1969) asserts that "[e]xperience which is passed on from mouth to mouth is the source from which all storytellers have drawn." (p. 84)

What can result from negative media overload is what Zaki (2020) calls "compassion collapse" – a sort of collective bystanders' effect – which describes the sheer impossibility of empathizing due to an overabundance of negative news (p. 589). "At the heart of the bystander effects lies a strategic interdependence between the actions of the individuals who can potentially offer help, whereby it is sufficient that one person volunteers to help in order for the victim to receive help" Fromell et

al. (2019, p. 940) write. However, especially in smaller group sizes, it has been largely discredited (cf. Jiang et al., 2021; cf Latané & Darley, 1969). This points to the effectiveness of personal accounts as opposed to impersonal, discursive 'bigger picture' narratives.

As Zaki (2020) notes 'disaster myths' are not the only possible result of catastrophe: "disasters produce groundswells of prosocial behavior and feelings of community" (Zaki, 2020, p. 588). This "catastrophe compassion … follows earthquakes, war, terrorist attacks, hurricanes, and tsunamis and now a pandemic," Zaki (2020) argues (p. 588). One root for this "catastrophe compassion" can be found in group identity, which, as a social construct, can be influenced and formed, as Zaki (2020) writes: "One pertains to the powerful nature of social identity. Each of us identifies with multiple groups, for instance based on our generation, ideology, or profession, and we commonly express loyalty, care, and prosociality towards members of our own groups" (p. 588). Another factor he points to is "emotional connection. Empathy – sharing, understanding, and caring for the emotional experiences of others – predicts prosocial behavior across a range of settings" (p. 588). Through a shared, emotional experience, group identity and connection grow.

Interestingly, studies point to the fact that this compassion outlasts the actual event (e.g. floodings or similar) and that a positive emotional (i.e. empathic) response does not only result from positive events (c.f. Vollhardt, 2009). As Vollhardt (2009) notes, "altruism has been mentioned as one possible manifestation of 'posttraumatic growth'" (Vollhardt, 2009, p. 54). This growth, Solnit (2010) notes, can result in a sort of "nostalgia for a time that was in many ways much harder but is remembered as better, morally and socially" (p. 21). This points to a positive perception of negative events that can help bring communities and individuals closer together. Zaki (2020) suggests that one way in which positive effects of 'catastrophe compassion' is to make peoples' efforts visible to others: "One way to achieve this is to reify and formalize communities of disaster survivors such that they can remain visible to each other and salient to the identity of the survivors" (p. 589). In making the positive effects of such events visible, others are more likely to play a more active role, too. In short: making peoples' efforts visible creates more efforts.

Empathy can be made visible through representation of different projects, one of which is BeAnotherLab that utilizes VR to make empathy visible and *felt* through the perceived out of body

experience, in which a VR headset is mounted on two peoples' heads that stand across from each other (in this case one refugee and one bystander) and equipped with a camera. The image each person sees is that of their own body. Slowly, the participant touch each other's hands, creating the feeling of taking on the perspective of the respective other (Ng, 2021).

Similarly, Chris Milk (2015) in his TED talk tells the story of his VR film *Clouds over Sidra*, about which he says:

> And when you are sitting there in her room watching her, you are not watching it through a television screen, you are not watching it through a window, you are sitting there with her. When you look down, you are sitting on the same ground she is sitting on. Because of that, you feel her humanity in a deeper way. You empathize with her in a deeper way.

Since his TED talk, the term "empathy machine" has been widely adopted (cf. Sora-Domenjó, 2022; cf. Bujić et al., 2020; cf. Najjaran et al., 2012), ostensibly bringing "users' attitudes towards both the presented individual and the respective group are affected" (Sora-Domenjó, 2022, p. 1411).

While studies have shown that empathy can be improved through the use of VR, this is only true for affective empathy (also called emotional empathy), but not cognitive empathy (Martingano et al., 2021; Goldstein et al., 2009). In a meta-analysis of "all known studies investigating the relationship between virtual reality and empathy", Martingano et al. (2021) conclude that the positive impacts on emotional empathy did not diminish over time (p. 7).

2.3 Agency and Storytelling

> *Fairy Tale signifies belief in the supernatural, not the suspension of belief. We all believe in the extraordinary of Once Upon a Time. We need to believe. We breathe through our tales.*
>
> - Vincenzo di Kastiaux (Zipes, 2011, p. 221)

How, when, where, and why we are telling stories has an immense impact on how these stories are perceived and retold (cf. Foucault, 2002). Again, Boje (2019) notes a change in the manner of narration away from storytelling and towards discourse. He writes:

> Bakthin, Stein, and Benjamin assert that folkloric storytelling began to decline with the invention of the printing press, becoming something archaic. Everything becomes just text.

> In place of epic stories, novels and newspapers become discourse that is disconnected from lived experience (p. 337).

Storytelling means sharing experience. This experience, in turn, becomes the experience of the audience, albeit not a *lived* experience. Benjamin (1969), states: "The Storyteller takes what he tells from experience – his own or that reported by others. And he in turn makes it the experience of those who are listening to his tale" (p. 87). This points to an element of novelty that intrigues the audience. Similarly, Currie (1998) ascribes a special power to fictional narratives: "the production of sympathy" (p. 22). Taking into account Keen (2008), sympathy – this "semantic close relative" (p. 208) – can pave the way to empathy. Precisely through contact hypothesis and – as I will discuss further now– agency through the performative, empathy can be achieved.

To fully engage the participants and create a sense of urgency, agency is equally important. Weissman (2020) states: "Agency implies purpose, action, and autonomy. We are inventive, effective, and self-appraising" (p. 1). Agency, to Weissman (2020), is something counter to Aristotle's Cartesian conception, something that cannot just be attributed to the mind: "It supposes that we know reality when mind turns on itself, though agency is apparent to anyone taking a walk or calling a friend" (p. 1). What is interesting here is not the question over a mind/body dichotomy, but rather the action, and what Judith Butler (1997) calls the *performative.* In relation to this project, I argue that it is precisely through agency and the performative act of *doing* something that the audience is enabled to find new ways of empathizing with the subject at hand, i.e. the Amazon rainforest and people affected by its deforestation. By means of walking (or clicking) their way through the virtual rainforest, the spectator gains agency – and thus becomes more empathic. They become participants.

2.3.1 Different modes of storytelling

(Hi-)Stories come in different forms: they are told orally, through verbal communication, nonverbal representation, in written form, or read aloud. "To tell a story is to take arms against the threat of time, to resist time or to harness it. The telling of a story preserves the teller from oblivion," Portelli (1981) writes (p.162). Thus, they always serve one purpose: remembrance. Whether the contents of these memories are factual or fictitious does not matter. There is value in memories.

As Bennett (1983) states: “If memory is a value, what is the value of remembering? Why remember? Hegel once remarked that the only thing we learn from history is that no one ever learns anything from history” (p. 4). Of course, she is paraphrasing Hegel to exaggerate the point that history seems to repeat itself when one looks at general motifs (wars, religion, and exploitation as well as love, community, and generosity). Because stories and the remembrance of these stories, form cultures. Memories, and remembering, then, become a driver for cultural identity and collective memories: things and events to consider and experiences to learn from. The memories shared are the memories of someone else’s lived experience that can have a greater impact on the culture as a whole. The retelling of these stories, thus, becomes a reinforcement of this culture and an intercultural mutual understanding (cf. Stevenson, 2018). Through their narratives, children, foreigners, and those who are part of that culture become more closely connected, more empathic to it. On this basis, remembrance through storytelling becomes a powerful tool for intercultural exchange and empathy creation. “*Memory* creates the chain of tradition which passes a happening on from generation to generation” (Benjamin, 1969, p.98).

As Judith Butler (1997) argues, language is always an instrument of power, which is instantly linked to the performative act itself. Precisely because social behavior is based on mimesis and the performative, individuals perform due to a cultural script (cf. Riess, 2017). Stories help us add to this script and to situate ourselves within societies through copying and repeating the actions and norms we are given (cf. J. Butler, 1999). As a result, it matters a great deal what stories are offered and retold. *Who* is telling a story and *whose* stories are being told will shape the future of cultures (cf. Stevenson, 2018; cf. Schachtner, 2020). One mode of storytelling is oral history. Bennett (1983) states: “Another reason oral histories are good as carriers of human values is that they are themselves values. The bucket is made from the same material as the items it is carrying” (p. 4).

The same is true for fairy tales that have moved from being recited from memory to being read in silence or out loud. The term fairy tale itself was coined by Marie Catherine d’Aulnoy in 1697 (Zipes, 2011, p. 222). In contrast to other types of literature, a fairy tale’s main purpose is the development of morals and meaning (Eco, 1998, p. 139) through symbolism in relation to people’s fears and wishes. Sale (1977) writes:

> They reach back into dateless time, speak with grave assurance of wishes and fears, harbor no moralizing, no sense of 'art,' because their ways and means are so varied and so consoling in their knowledge that there are many stories to tell, many ways to tell the 'same' story (p. 372).

Sale (1977) goes on to argue that, when readers are unable to share said tales, "the delicate balance between the wishes and the fears is easily tipped and the result is a reader who thinks fairy tales are daydream wishes or nightmare fears when in fact they are neither" (p. 374). These wishes and fears, Scott (2011) reiterates, make the "human existence meaningful" (pp. 203-204).

In contrast to news stories, fairy tales leave most things unsaid, open to interpretation, and in the realms of ambiguity. As Boje (2019) points out "the writers of novels, and the newspaper took over, and oral storytelling no longer conveyed the fullness of life experience and hardly any wisdom" (p. 340). Of course, it is precisely the purpose of the news to stick to the facts and leave as little open to interpretation as possible. Yet, a study conducted by Princeton University, came to the conclusion that humans seem to be predisposed to focusing more on the negative than the positive, driving the old journalistic aphorism of 'if it bleeds, it leads' even further (Soroka, 2019).

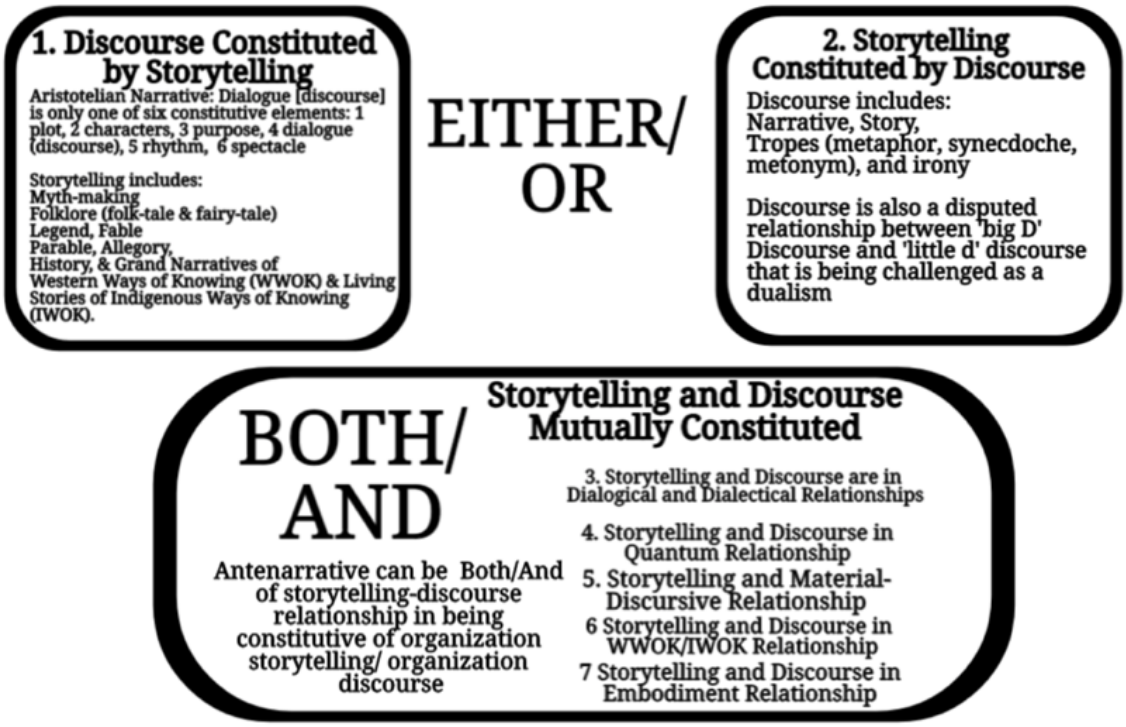

Figure 8: Seven Problematics in the Relation between Storytelling and Discourse (Boje, 2019, p. 337)

Drawing from Boje (2019), storytelling is oftentimes perceived as being opposed to discourse, the personal versus the bigger picture, fact versus fiction. Boje (2019) calls this connection between storytelling and discourse "storytelling organization" (see figure 8) that touches on "the relations between discourse and nondiscursive socioeconomic and sociomaterial events, processes, reconfigurations, and practices that bring stories and narratives into being in embodied practices of talking, writing, and acting" (p. 340). In his work, he describes a decline in storytelling that has been replaced by (organizational) discourse – i.e. that is "replete with text" (Boje, 2019, p. 343).

With his concept in mind in which storytelling and discourse are mutually constituting, I have included in the project accounts and articles that offer both personal stories as well as an idea of the bigger picture: discourse.

2.4 Immersion of Body and Mind

The technological developments of the last hundred years have given rise to exciting new ways of experiencing the world around us. The rise of the peace movement in the late 1960s has led to the adaptation of the Internet from a former military communication tool to a more democratic means of connectedness (cf. Leiner et al., 1997). The transformation from dot.com to Web 2.0 has given rise to more interactive content – first through forums and later clicking through virtual worlds in online games and Google Maps (cf. Bakir, 2010). The aim to break the proverbial window into another world has resulted in immersive technology such as virtual reality and augmented reality that places the spectator at the center of the scene.

AR (augmented reality) and VR (virtual reality) have long been used to create empathy relating to topics such as refugee crises, disabled people, or transgender studies (cf. Alberghini, 2020). An early precursor to modern VR technology was the stereoscope, commercialized by William Gruber in the 1930, but had been invented almost a century prior. Early applications included surgical simulations, flight simulations, and movies (cf. Paro et al., 2022). A prognosis from 1992 reads:

> [V]irtual reality has been hyped via cover stories and the network news. It has been called the most exciting avenue of scientific exploration since the discovery of gravity; a microscope for the mind; an electronic tool for expanding consciousness that is destined to redefine the nature of human-computer and human-human interaction. Some claim that VR will produce the greatest paradigm shift since Darwin ("Virtual Reality", 1992, p. 2).

VR and AR technology offer "visual rendering of the simulated environment, interactivity, motion tracking, and haptic feedback. These components have become significantly more advanced since their earliest iterations" (Paro et al., 2022, p. 38). While VR requires hardware (e.g. a VR headset such as an *Oculus Rift*) and a space in which the virtual world can be experienced (e.g. an exhibition hall), AR can be accessed from a desktop computer or smartphone and thus is accessible to a broader audience with little logistical preparation. To implement an AR that is accessible for numerous people from any location around the world, a website is the most sensible form of presentation. The rainforest is accessed in 360°, which allows the audience to navigate through it like Google Street View (i.e. in clicking through it) and explore the storyline that has neither a beginning nor an end. As Metzinger (2018) argues, "technological VR is the representation of *possible* worlds and *possible* selves, with the aim of making them appear ever more realistic – ideally, by creating a subjective sense of 'presence' in the user" (p. 3).

Drawing from Judith Butler (1997), agency and the performative become essential in furthering empathy in the audience. Through actively engaging *with* the story, the audience is immediately more closely connected with the subject. The act of walking, whether physically walking through an exhibition hall while wearing a VR headset or by clicking through an AR world, constitutes this performative act and a notion of agency. In their study on empathy creation through virtual reality, Schutte and Stilinović (2017) come to the conclusion that the "findings suggest that greater engagement or sense of presence induced by virtual reality may intensify a variety of emotional and cognitive reactions, including empathy" (p. 711). Other studies have pointed to bodily extensions that can even be mapped in the brain, further pointing to the brains ability to read virtual reality as lived experience (cf. Cohen et al., 2014).

As Herrera et al. (2018) point out, each media channel engages a different human sense (i.e., videos and written texts engage the eyes, while audio formats such as podcasts draw in audiences through auditory cues), which are often addressed simultaneously. Multi-sensory experiences, Herrera et

al. (2018) argue, create a higher level of engagement. Interestingly, tasks such as reading, watching a play, or looking at a piece of art, require higher levels of imagination to illicit empathy through taking on different perspectives (a "precursor to empathic concern" (Riess, 2017, p. 76) as compared to virtual immersions the spectator *feels* as if they are part of the story and does not just have to imagine it – a result of embodied cognition theory which notes "that cognition is an interaction of body and mind" (Herrera et al., 2018, p. 4).

This negates a Cartesian Dualism, which postulates doubt as the starting point of his school of thought, to which Descartes (2008) ascribes a hierarchical order that is of a higher rank than that of the body: "cogito, ergo sum" (p. 67) – I think, therefore I am – his first principle. Aristotle's understanding of body and mind (or soul) allows for an interplay of the two (cf. Bast, 1997). "Besides the five senses and the central sense, Aristotle recognizes other faculties that later came to be grouped together as the "inner senses," notably imagination and memory" (Kenny, n.d.). Similarly, Helmuth Plessner (1975) combines body and mind in the "Körperleib" (flesh-body), in which the *Leib* offers a lived experience of the mind, i.e. through blushing and other involuntary bodily reactions (p. 121). It is precisely this interplay between body and mind that allows for empathy, which is even more accessible through the use of AR and VR, which incorporate both body and mind in a performative manner.

But why move the rainforest into the realms of the virtual and semi fictional? Eco (1998) notes that "every fictional world is based, parasitically, upon the actual one, which the fictional world takes as its background" (p. 93). According to him, these fictional worlds offer comfort and safety to explore those things that are most uncomfortable to us (Eco, 1998). "If fictional worlds are so comfortable, why not try to read the actual world as if it were a work of fiction? Or if fictional worlds are so small and deceptively comfortable, why not try to devise fictional worlds that are as complex, contradictory, and provocative as the actual one?" (Eco, 1998, p. 115). The answer to both questions, according to Eco (1998) is: we do! And authors such as Dante, Shakespeare, and Joyce have done precisely that.

Immersive forms of media lend themselves to being taking the spectator to another place – real or imagined. From a point-of-view experience of a tree (Zec et al., 2014), a four-part series of

360-degree movies on the climate crisis (Dennis & Strauss, 2018), as well as *The Hydrous,* a series of immersive ocean dives (Lee, 2021). In *This is Climate Change* the user experiences four scenarios – fire, famine, feast, and melting ice – that place them in the center of these catastrophic events. *Tree* allows the user to go through the life cycle of a rainforest tree – starting with the seedling. While the user's body forms the trunk, the arms are the branches that sway in the wind (Zec et al., 2014). A study conducted on perspective taking of non-sentient being such as trees concluded regarding their qualitative data that this type of embodiment can lead to a better understanding of and caring for nature. However, 43% of participants struggled to take on the tree's perspective (Spangenberger et al., 2022).

While only *The Hydrous* clearly states that the goal is to create more empathy, all the mentioned examples aim to improve pro-social behavior. *The Hydrous* website reads: "Our Decade Programme combines evidence with empathy. A key element in bridging scientific discovery and public understanding is human connection through meaningful ocean experiences" (Lee, 2021). Interestingly, the project has conducted studies on the effectiveness of their immersions, however, none on the impacts on empathy.

3. Planning and Equipment

The planning for *Into the Rainy Woods* began in February 2020 during the first year of my master's studies at *Universidade Católica Portuguesa* and continued throughout my second year and my attendance at the *Pontifica Universidade Católica do Rio de Janeiro.* The project was shot in the last quarter of 2021. Due to the COVID-19 pandemic, most interviews were held online, however, I was able to visit a few parts of the Amazon rainforest in Brazil.

Three cameras were used, each of which provided a different format and perspective: the Insta360 Twin Edition for all footage in 360° as well as wide-angle video footage, a 35mm Pentax Super Me camera for analog photography. The Insta360 ONE R is a modular camera that allows for the use of two different lenses: 1) two 180° lenses that later stitch the footage to a 360° image and 2) a 4k wide-angle lens. For any audio recordings, I used a Zoom recording device.

The Amazon rainforest stretches across eight countries – Brazil, Bolivia, Peru, Ecuador, Colombia, Venezuela, Guyana, and Suriname. I chose Brazil as it is home to 60% of the Amazon rainforest with a loss of "89 Mha [million hectares] of natural vegetation from 1985 to 2019" (European Parliament, 2020, p.17).

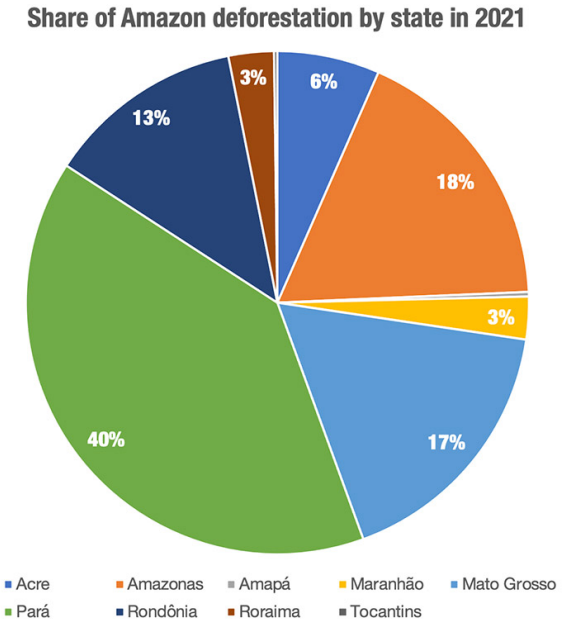

Figure 9: Preliminary Amazon deforestation share by state in 2021 according to INPE (R. Butler, 2021)

All footage was shot in the Amazon rainforest. The sites include the state of Pará and different locations in and around Alter do Chão, as well as the state of Amazonas, specifically the city of Manaus and the more secluded Paraná do Mamori. I have chosen these locations for two reasons: 1) both are majorly impacted by the effects of deforestation (the state of Amazonas 18% and the state of Pará 40% according to data from the space surveillance agency INPE from 2021, see figure 9) and 2) their relatively easy accessibility as well as close proximity to one another that allowed me to plan my travels from Manaus to Santarém with a boat (see figure 10). All content was shot, recorded, and written by me.

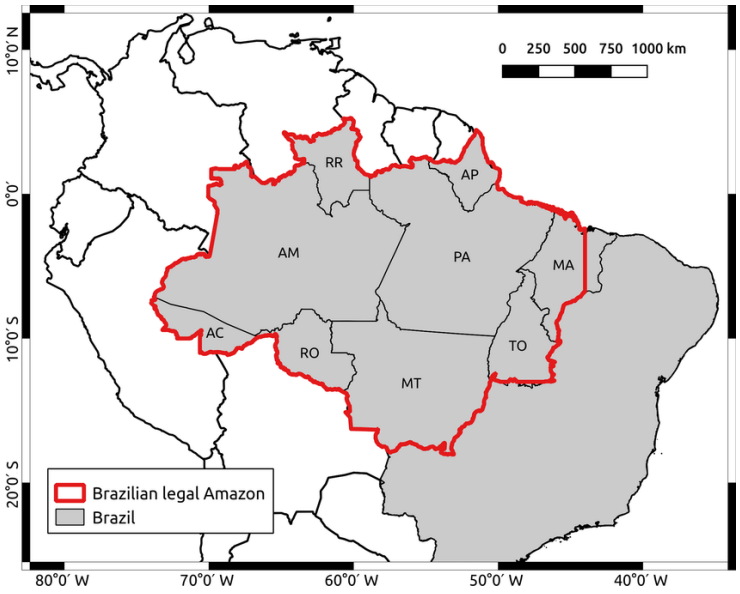

Figure 10: Map of the Brazilian legal Amazon and its nine federal states: Acre (AC), Amapá (AP), Amazonas (AM), Maranhão (MA), Mato Grosso (MT), Pará (PA), Rondônia (RO), Roraima (RR) and Tocantins (TO) (Müller-Hansen et al., 2017).

4. Digital Storytelling

In order to conceptualize a storyline that allows for more empathy and equal status in the hierarchies of the stories that are being told, I looked at different modes of storytelling. Predominantly, modern and even ancient (Western) storytelling has a tendency to draw on the audience's emotions, offer values, and aim to provide experiences. "The relationship between narrative and philosophy goes back to ancient Greece (at least) and the beginnings of Western philosophy—to Socrates's radical commitment to the back-and-forth exchange of ideas and Plato's inscription of these conversations as dramatic dialogues" (Craig, 2014, p. 439). Storytelling, often assumed to be largely situated in the realms of fiction, can be found in any form of narrative – whether factual or fictitious. Because history always choses a perspective, all historical accounts, thus, become storytelling. Scott (2011) ascribes a perceived dichotomy to the two – fact and fiction – that is less black and white than often perceived. I am not trying to negate a fundamental difference between the two. However, the interpretation of facts is often perceived as factual. And it is this interpretation that I would like to, at least where possible, leave up to the audience. Thus, a back-and-forth exchange – multilateral and interactive – is essential for an immersive experience that aims to create more empathy for a certain topic because there is room for interpretation and ambiguity – in this instance the Amazon rainforest. In many ways, Joseph Campbell's *Hero's Journey* (1949) can be seen as a modern version of the ancient tragedy, which serves one main purpose: morals conveyed through narratives.

4.1 The Virtual Hero(ine) of the Story

In order to create an immersive narrative into the rainforest, I adapted Joseph Campbell's (1949) *Hero's Journey,* which outlines postmodern narratives and storylines as utilized by Hollywood and other productions. Figure 11 shows the most important steps: The hero(ine) is introduced in the ordinary world and, from there, is called to an adventure. After the 'new' adventure world is established, the hero(ine) refuses the call to adventure. With the aid of helpers, they eventually set out to the mission at hand. Mentors, helpers, and enemies as well as 'challenges and temptations' are introduced along the way to create suspense, leading to the hero(ine)'s transformation and atonement. Eventually, the hero(ine) returns home, underlining the changes they have gone through via their experiences.

One example one can think of when retracing the steps of the hero could be *The Lord of the Rings*, in which Frodo is called to adventure by the wizard and reluctantly sets out on his journey. The Fellowship of the ring is made up of what Campbell calls the "helpers." On the journey, they encounter numerous hurdles that are overcome with the help of others – often unexpected helpers (such as Gollum or the returning Gandalf the White) (Jackson, 2003).

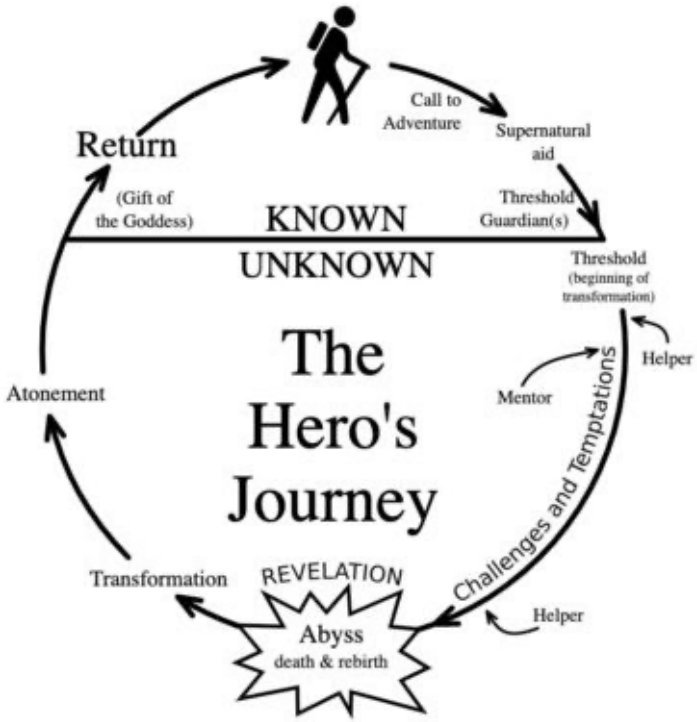

Figure 11: Campbell's Hero's Journey (Bodin, 2020).[5]

To adapt Campbell's (1949) concept to an immersive, nonlinear storyline, the metaphor of the rhizome was used to shape the narrative (figure 12). Whether the audience wants to walk in circles, to get lost, or is exclusively interested in the fauna, is left completely open. Each narrative will thus be different – never incomplete or redundant after several explorations. The benefits of a

[5] Bodin (2020) adapted the Hero's Journey for feminist storytelling.

virtual implementation are that the story does not have to be linear, and all elements can be interconnected to underline the nonhierarchical setup of each story with regards to all other elements presented. As a result, the rhizomatic structure defies spatial boundaries.

In the project's initial conception, the viewer enters the rainforest at the beginning of the 360° video – either as an AR or VR view. The elements are placed as vector graphics within the video itself, e.g., as an icon on a tree that is passed as a hotspot that is visible in the distance. Once the audience clicks on the icon (again, either utilizing a cursor or a VR controller), the element opens in a pop-up window.

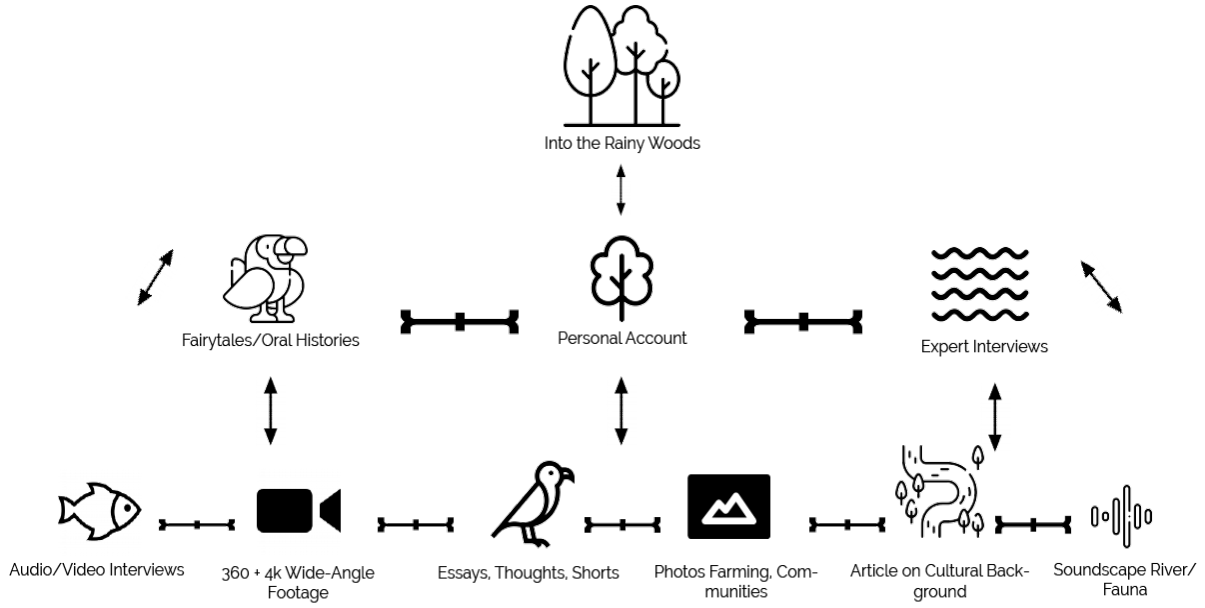

Figure 12: The Walker's Journey, Julia Kausch, 2021.

As the aim of *Into the Rainy Woods* is to create awareness on the issue surrounding the rainforest, Game Studies are left out of this project and could be incorporated should the project be set up in a VR or AR installation.

5. Production

Production, for the most part, took place during the fourth quarter of 2021 and was conducted in the states of Pará and Amazonas. As previously mentioned, I deliberately chose two bordering states. In September 2021, I flew to Manaus and explored the surrounding areas, conducted interviews, and shot footage in Manaus and Parána do Mamori for 8 days. From there, I took a public, overnight ferry from Manaus to Santarém and a bus to the more secluded Alter do Chão.

To get a better understanding of 360° content, I took a Masterclass by the 360° videographer Hugh Hou (*360° VR filmmaking masterclass*). Due to the COVID-19 pandemic, interviews were held online and some sites, such as the ATTO site, indigenous villages, and INPA, could not be visited in person.

5.1 Shooting

While the walks were shot in 360° using an Insta360 ONE R Twin Edition that utilizes two monoscopic 180° lenses whose shots are later stitched together (figure 13), photos were taken with an analog Pentax camera (figure 14), as well as a regular 4k wide-angle module for the ONE R.

Figure 13: Screenshot *Into the Rainy Woods*, handheld Insta360 ONE R Twin Edition, 360° video, Parána do Mamori, State of Amazonas, 2021.

Audio field recordings were captured with a Zoom recording device. Due to the COVID-19 pandemic, footage of the interviews was extracted from the Zoom calls.

Figure 14: Canal do Jari, Alter do Chão, Pentax ME Super, Kodak Ektar 100 35mm film – Samaúma tree, which locals call "árvore de comunicação" and use for communication purposes in hitting the big trunk roots, 2021.

The elements included range from audio recordings, photos, and videos, all of which were captured in the states Pará and Amazonas (Alter do Chão, Paráná do Mamori, and Manaus). I rewrote selected fairy tales from Dorson et al. (1997) and transformed them back into oral form. This allows for a different form of addressing the spectator (i.e. like a child), albeit the model reader (or listener) does not have to be a child. Nonetheless, to revert back to Eco (1998), the fairy tale instantly tells the model listener that a story about morals will ensue. But why have it read out load instead of keeping it in its written form? While research does not point to significant differences in comprehension of text and audio (cf. Rogowsky et al., 2016; Baskin & Harris 1995), studies have long asserted to different learner types (i.e. visual, auditory, kinesthetic, tactile) that should also be considered in the context of fostering social understanding and sharing experiences (cf. Masito-

warni & Haswani, 2020; Zarrabi, 2016). As Judith Butler (1997) argues, speech is always an exertion of power and, thus, who is speaking about what and whose stories are told is of great importance to create a shared experience. The fairy tales included in this project have been collected in different parts of the rainforest and were later written down[6], it was of great importance to me to rewrite three of these fairy tales and have them read aloud by Mariana Bolza – a Brazilian native (Dorson et al., 1997).

5.2 Interviews

Finding interview partners from a broad variety of backgrounds was important to give several perspectives on issues surrounding the Amazon rainforest. However, the language barrier, COVID-19 restrictions, as well as remote areas with no or limited access to the Internet narrowed the spectrum of possible candidates.

To get a better understanding of the discourse from within the Amazon region, I researched different magazines and newspapers in the state of Amazonas.[7] Among others, I reached out to Alfredo Lopes, portal administrator of the online platform *Brasil Amazônia Agora* in Manaus that delivers daily news updates on topics surrounding the Amazon (Lopes, 2022). Scholars in the fields ranging from biology, economy, philosophy, politics as well as climate change advocates are contributing authors to his platform. During our chat, Lopes talks about issues, hopes, and the future of the Amazon. The interview is incorporated on the website in written form with a brief introduction into the subject matter. The interview offers a different, non-Western perspective on the issues surrounding both the environment and the media: “The Brasil Amazônia portal is now the result of a collective decision by professors, entrepreneurs and thinkers from the Amazon, concerned with disseminating the point of view of those who live here and work here” (Kausch,

[6] Because different versions of these orally delivered tales can be found, the authors chose one version for each fairy tale (cf. Dorson et al., 1997).

[7] Over the course of the last two years, I have reached out to numerous magazines, radio stations, organizations (private and governmental), as well as platforms. Among these, I tried to include perspectives from indigenous communities. One such medium is Rádio Yandê, an indigenous radio station broadcasting from Rio de Janeiro. Unfortunately, as in many other instances, the communication stopped before a meeting or interview could be scheduled (*Rádio Yandê - 1ª rádio indígena web do Brasil,* n.d.).

2022a). This interview sheds light on differences in environmental news coverage in Brazil as opposed to Western media.

Through Mr. Lopes, I got in touch with Augusto Rocha, professor at the Universidade Federal do Amazonas. After his PhD in Transport Engineering, he continued as professor for engineering with a focus on construction, logistics, and transport systems as well as the economics. He later began teaching Innovation Technology and Biotechnology and ventured into the business sector, working as the director for an industrial association and consultant. In his work, he addresses questions like: How can goods from the Amazon rainforest be used in new medicines and products? How can the infrastructure in Manaus be enhanced and made more efficient? And how can the region be protected in order to flourish, both environmentally and economically? In our interview, he stresses the importance of education and utilization of the resources available with a special focus on their implications of biotechnologies. His interview is incorporated in text form to highlight possible future advancements the Amazon region has to offer that go far beyond simply using it for agricultural purposes (cf. Kausch, 2022b).

As research on the Amazon region is an essential part of this project, it was of great importance to speak to scientists and gather factual input on the current situation. The first person in this category that I spoke to was Adalberto Luis Val (INPA) Instituto Nacional de Pesquisas da Amazônia (Brazilian Institute for Research of the Amazon), Manaus, Brazil. He works for the Department of Biodiversity, more specifically in the Laboratory of Ecophysiology and Molecular Evolution. In his work, he measures the effects of pollution on wildlife through mining and deforestation in the area. He, too, stresses the importance of education for the Amazon region and indigenous people in particular. His interviews is important because it diverts from a simple account about environmental impacts and rather ties them to political issues and educational disadvantages for indigenous people (cf. Kausch, 2022c).

Stefan Wolff, who also works for INPA and the ATTO (Amazon Tall Tower Observatory) in particular, shed some light on meteorological issues and changes in the area. The ATTO website states that the site is run as a multinational collaboration by scientists from Germany and Brazil.

> Its aim is to continuously record meteorological, chemical and biological data, such as the concentration of greenhouse gases. With the help of these data, we hope to gain insights into how the Amazon interacts with the overlying atmosphere and the soil below. Because this region is of such importance to the global climate, it is vital to get a better understanding of these complex processes. Only then will we be able to make more accurate climate predictions (*Project News - Atto - Amazon tall tower observatory,* 2021).

In our interview, Stefan Wolff speaks about the rainforests tipping point, current projects with the local indigenous people, as well as the importance of collaboration in this area. His perspective is of importance because, although he comes from a Western cultural background, he offers unique insights into meteorology as well as local projects to help incorporate the community into scientific practices in the forest (Kausch, 2022d). His is a prime example of intercultural encounters and engagement.

Philip Fearnside, a biologist and scientist from the United States, who has been working at INPA for 43 years, gives his insights into regulatory issues surrounding the rainforest. More specifically, these entail corruption, longwinded legal battles, statutes of limitation, and counterfeit permits. Fearnside offers a unique perspective as he has lived and worked under different presidents and is himself very politically involved in issues surrounding deforestation. He offers insights on what has changed under the Bolsonaro administration and serves as an example of political activism in the Amazon region. This offers the perspective of the overlaps of activism, science, and politics (Kausch, 2022e).

The last interview offers a different perspective on the rainforest: Andrew Soluna MacReynolds, who – after his first encounter with the Yawanawá people in the state of Acre – started collaborating with them to support the throughout the COVID-19 pandemic in setting up an online shop through which he sells their jewelry for them (cf. *Childrenofrainforest*). However, he is also involved in other collaborative projects with them such as building a traditional school in the village. His account offers insights into how and who can get involved in projects with indigenous tribes, while serving as a humbling reminder that what is often lacking, is that people listen to one another (Kausch, 2022i).

6. Post-Production

I completed all post-production using Insta360 Studio 2021, as well as Adobe Premiere Pro. All contents are available on the website created with WordPress for the project: www.into-therainywoods.com

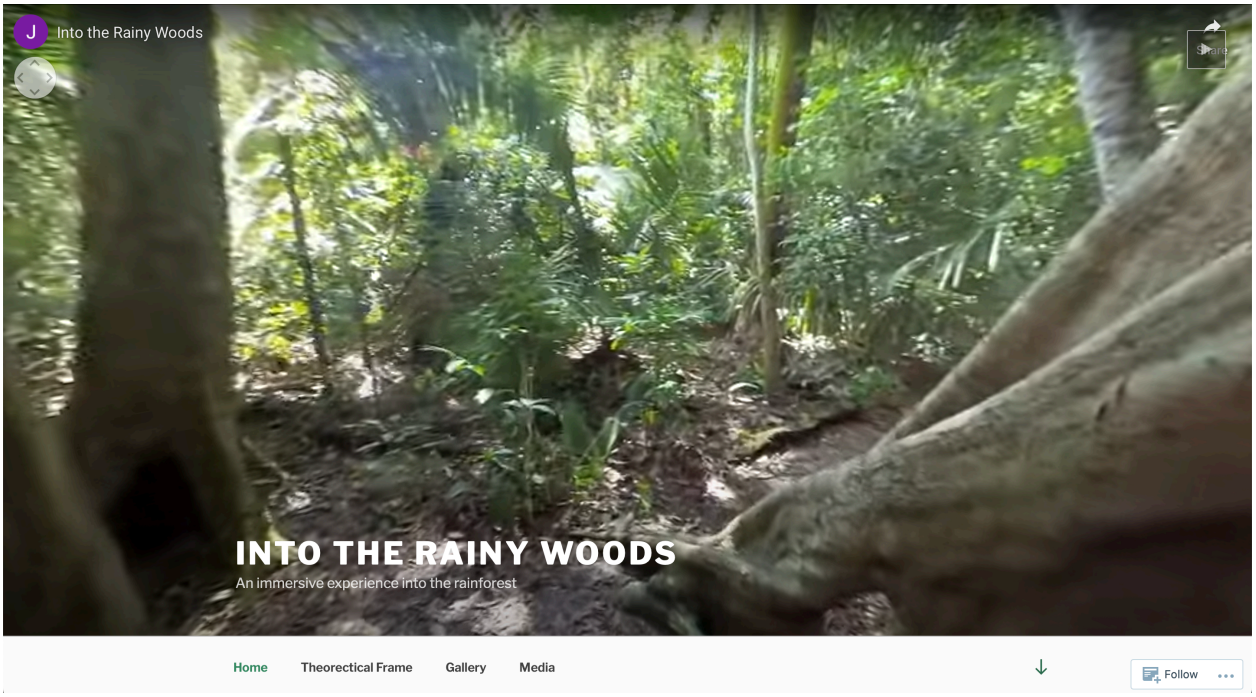

Figure 15: *Into the Rainy Woods* website with 360° header video optimized for desktop.

The website includes a shortened version of this paper. The final product, unfortunately, does not match the initially intended full immersion through AR. However, the 360° footage, as well as all other media formats, are available through the website.[8] The initial concept, in which software could have been used, or a design studio hired, could be realized with more funding available. Options such as Virtual Tours[9], and online AR-platforms such as eevo[10], and 3DVista[11] (Fletcher

[8] Please note that the website is optimized for desktop, hence the 360° footage is not accessible through mobile.
[9] One possibility could have been https://www.virtualtours.co.za, however, this type of immersion is optimized for commercial use and the use of panoramic photography, making the implementation with 360° videos impossible (Welcome to virtual tours. Matterport 3D Virtual Tours South Africa, n.d.).
[10] This option did not allow for a moving camera, i.e. the image could have moving parts in it, such as actors walking around it, but the camera itself has to be static, negating a walking sensation that I was trying to achieve (Create interactive 360° experiences. Eevo, n.d.) See: https://eevo.com/.
[11] This software could have worked out well, however, it is rather costly and, because of that, could not be utilized for this project.

et al., 2021), did not offer the needed functionality. Through the use of icons, the different media elements could be embedded into the woods.[12]

I produced all parts of the site in a manner that still allows for later assembly in a VR/AR set up. To incorporate several media formats, I chose to cut, and/or edit the interviews as follows:

- 2 video interviews (Adalberto Luis Val and Stefan Wolff)
- 2 audio interviews (Philip Fearnside and Andrew Soluna MacReynolds)
- 2 text interviews (Alfredo Lopes and Augusto Rocha)

The video for Stefan Wolff's interview has been split into shorter clips that can be watched separately or in conjunction with the others. This allows for shorter 'bites' of information the spectator can take in while walking through the virtual woods.

In order to revert the fairy tales taken from Dorson et al. (1997) back to an oral form, I have rewritten them and asked Mariana Bolza, a Brazilian native, to read them aloud for this project (Kausch, 2022f; Kausch, 2022g; Kausch, 2022h). As mentioned previously, this change in mode allows for different nuances in storytelling. Precisely because a fairy tale is fictitious yet offers moral and – in these cases – a sort of origin story – they are loaded with culturally specific values.

[12] These can be 'attached' to trees or placed in the forest in *Adobe After Effects*, which enables them to be trackable, i.e. to become part of the imagery that is tracked without moving with the camera.

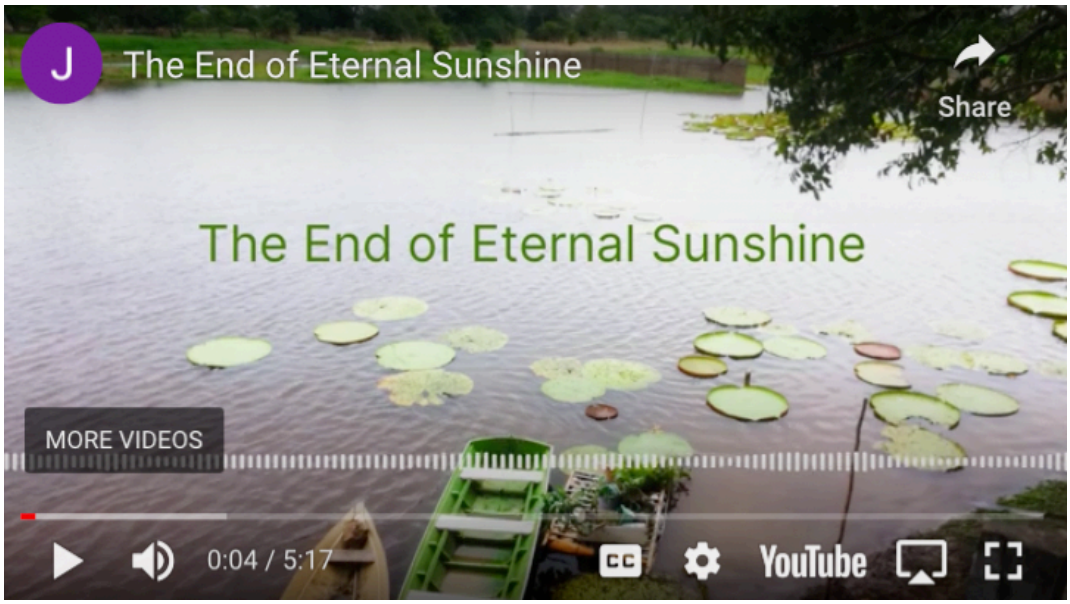

Figure 16: Audio from the fairy tale read by Mariana Bolza in Headliner and uploaded to YouTube

Final edits were done afterwards. Audio recordings from the Amazon rainforest were cut and uploaded post editing. Both fairy tales and audio clips were uploaded to *Headliner App* in order to add a cover photo. These were later on added to YouTube, which allows for a smoother embedding into WordPress.

7. Discussion

The production of *Into the Rainy Woods* required a lot of planning, time, research, and funds. Due to the latter, the concept had to be adjusted continually. The execution of *Into the Rainy Woods* as an AR project would have allowed for a better implementation of contact hypothesis, the aforementioned theory, in which equal status is substituted with a mutual ground – in this case the rainforest itself.

In navigating or "walking" through the rainforest by means of clicking or "discovering" information, images, videos, audio, and articles, viewers would have had the chance to experience it – though as a virtual abstraction – for themselves. The performative not only makes empathy more accessible because things do not have to be only imagined, but also *lived*, it allows for an interplay of both body and mind. Although many projects have combined immersive practices with a clear goal to creating more awareness and driving pro-social behavior, most do not include a study on their effectiveness in driving empathy and/or action (cf. Zec et al., 2014; cf. Dennis & Strauss, 2018; cf. Lee, 2021).

While studies have pointed to a lack of creating cognitive empathy through the sole use of immersive experiences (cf. Sora-Domenjó, 2022; cf. Martingano et al., 2021), its combination with other forms of media such as texts, fairy tales, and videos can: ""improvements in cognitive empathy appear to occur after people consciously engage in an effortful mentalizing. For example, reading fiction, which requires deciphering characters' intentions and motives, leads to improvements in cognitive empathy" (Martingano et al., 2021, p. 2).

Through the engagement of all senses (apart from olfactory elements), the spectator becomes part of the storytelling, part of the discourse surrounding the rainforest. With that, Boje's (2019) understanding of storytelling organization is put right side up again: "Now, the storytelling organization is no longer connected to Nature, to lived experience, but only engages in digital reproduction" (p. 353). Because *Into the Rainy Woods* is a digital reproduction, it allows for a connection to nature that otherwise would not have been possible for most people. The virtual rainforest becomes a mutual meeting place which takes the audience to a corner of the (virtual) Amazon.

Just like the woods, all stories are interconnected in a rhizomatic manner, albeit not always on the surface. And because of this false sense of comfort readers experience when they enter fictional worlds, the actual world is often times read like a piece of fiction (cf. Eco, 1998, pp. 117-118). Complexity seems to be the key driver, then, to crafting stories that are nuanced, ambiguous, and contain a world of perspectives which allow comparisons to the real world. The first, of course, will never reach the complexities of the latter. However, taking into account the aforementioned implications of Empathy Studies and how each medium can create empathy, the fictional (or in this case virtual) world becomes a driver for empathy in the real world.

Eco (1998) notes: "Our perceptual relationship with the world works because we trust prior stories" (p. 130). Which stories we trust, therefore, becomes of the utmost importance to create awareness and a better future. Or, as Coste (1989) puts it: "Narrative = reality = history. All three are perceived as a master plot. All four are unfinished" (p. 27). This points to cultural dynamics that have to continually be reinforced – that can actively be shaped.

Boje's (2019) outlook on current storytelling and discourse organization is pessimistic to say the least. However, his conception of a mutually constitutive organization of the two holds the key to unlocking not an either or, but an *and.*

> The encyclopedia memory of the storytelling organization has transitioned from epic story work by storytellers to digital work, to keystrokes. We are no longer in the womb of the epic story, and the so-called "digital storytelling" in "digital organization" is lifeless. Storytelling organization has changed the balance between acts of narrative digital narration and the web of mouth-to-mouth living stories of life existence (Boje, 2019, p. 353).

In this context, a metaphor can become more than just that. For instance, the metaphor of the woods is, of course, not *just* a metaphor but a real, living organism on this planet, which – due to discursive cues (i.e., what the model reader learned from fairy tales) – implies that the audience has to find their way out, start listening, and find solutions to issues surrounding the rainforest. The woods carry symbolism, not only for western cultures, but most cultures that live in proximity to them. Sale (1977) states regarding western narratives:

> Now then, what is the wood? Does it mean anything, symbolize anything, suggest anything? Well yes, of course, because in the woods one can get lost, or encounter known or unknown dangers, and this happens so often in a wood that one begins to make the easy

> associations, so that when these associations are denied or ignored … one is quickly aware of it. But forests in fairy tales are so frequent, and their associations so obvious, that they come to seem a given, not unlike the opening chord in a piece of music that can be played loudly or softly, by this or that instrument or the ensemble. It is, thus, important, because the story could not proceed without it, but the last thing one needs to do is to ponder what it means, because what it means will be what is made of it (p. 383).

Thus, the setting of the woods offers the perfect canvas for the stories that are told in *Into the Rainy Woods* – and even more so those that have not yet been told and need to be heard. In mixing fairy tales, articles, interviews, as well as different media formats, and presenting them in an implausible place – i.e. the virtual woods – the goal of this project was to make the stories 1) more accessible and 2) free from a setting that implies any prior interpretation, albeit discursive metaphors and imagery. Sale (1977) argues that "[f]airy tales are told almost without remark or interpretive commentary, and atmospheric efforts or other similar signals are almost entirely absent" (p. 382). In placing different modes of storytelling and discourse next to one another, the same can be said about all other media presented on the website. *Because* certain stories such as the fairy tales are told without direct remark placed next to them, the audience is allowed to approach it in any way they like – whether childlike or from an academic perspective.

In combining different modes of storytelling and discourse, the spectator gets to experience not only 'news' stories (i.e. articles), but also fairy tales, videos, essays etc. According to Benjamin (1969), the audience enjoys stories from near and far, pointing to an element of the unknown in storytelling that entails a lust for experience through stories, in which "one is embodied in the resident tiller of the soil, and the other in the trading seaman" (pp. 84-85).

Other media contents such as the written interviews are contextualized to allow for a better understanding of how the different perspectives and issues tie into a historical and/or political context. The impacts of the Western exploitation– past and present – of the Amazon region are very much apparent and inscribed into the region. "To understand this conundrum, one has to look back a few decades – namely to the year 1967, when the city was made a free trade zone to facilitate the establishment of an industrial hub" (Kausch, 2022b). Because these remnants of colonialism, the rubber boom, and current exploits through mining and farming (Galey, 1979) all tie into the issues

surrounding the Amazon rainforest today, it is important to offer different accounts and contextualize their meaning where necessary. The interplay of different forms of media (audio, video, and text) and various modes of storytelling (interview, articles, oral fairy tales, photos, and videos) leaves room for interpretation, yet gives background information so that the participants get to experience different facets of the (virtual) rainforest.

Especially the interviews allude to highly political issues. A lack of enforcement (Capelari et al., 2020), counterfeit permits for deforestation, and a corrupt system that marginalizes indigenous people (Carvalho et al., 2019), while educational opportunity hoarding (cf. Tilly, 1998) by the national government, and the exploitation of resources by national and international companies and governments are prevalent. And yet, many people are apathetic, or take no action regarding these issues. *Into the Rainy Woods* presents a number of examples of how people can help, i.e. through work in indigenous communities, political activism, or educational programs (cf. Kausch, 2022d, cf. Kausch, 2022i). Projects such as *Into the Rainy Woods* could offer new ways to create empathy could help counter the general lack of action that is prevalent regarding the Amazon rainforest and other political and environmental issues. Betts et al. (2008) conclude:

> The challenge of maintaining the ecosystem services of Amazonia (and other regions) in the face of deforestation pressures and climate change will require interdisciplinary research and analyses that span the climatological, ecological, social, political and economic sciences, and interface effectively with regional and international policy (p. 1734).

Regional and international efforts will include changes in the way agriculture is handled in the Amazon regions as well as how policies that are in place are enforced (Carvalho et al., 2019).

Although the final version of *Into the Rainy Woods* offers less an immersive experience and more of an archive of the rainforest through the presentation of different types of media such as audio files, video interviews, photos, and articles, the sense of agency in exploring different perspectives is still underlying. As mentioned before, Benjamin (1969) postulates: “The Storyteller takes what he tells from experience – his own or that reported by others. And he in turn makes it the experience of those who are listening to his tale” (p. 87). Through the use of a rhizomatic, nonhierarchical

structure, all perspectives are of equal status, hence the same can be said about all *experiences* shared.[13]

The manner in which discourse is formed through different accounts of storytelling draws from *Jungle Memory* mentioned in the introduction (figure 1). Like the image that references many other images on the Internet, yet tells its own, unique story, *Into the Rainy Woods*, too, makes use of many elements that, combined, tell unique stories. The project exemplifies how storytelling and discourse constitute one another. More stories, images, accounts, and connections can be added to it, because, just like cultures and the woods, it is dynamic and should be changing over time.

As Benjamin (1969) argues, stories, by nature, are told orally. Of course, with the emergence of the printing press, this oral tradition in storytelling shifted to written discourse. Again, I would like to draw from Boje (2019), who, citing Benjamin, ascribes a falling in morals to this very shift from storytelling to discourse. Instead of an either or, however, he is calling for an *and*.

Predominantly negative news coverage (cf. Soroka, 2019), one-sided accounts that do not offer different perspectives, and, in extension, a lack of discursive exchanges as well as cultural understanding make it hard for people not in the know to grapple with the full extent of ramifications of deforestation and the loss of the Amazon rainforest. To allow for contact hypothesis, I opted for first-hand accounts, in which I let researchers, fairy tales, and photos speak for themselves. This, in turn, leaves room for interpretation. In the case of the fairy tales, for instance, a lack of an offered explanation or interpretation leaves room for personal learnings and takeaways as well as a different approach to the cultures of the Amazon region. The virtual rainforest creates a space in which spectator and storyteller can have an encounter of equal status.

My aim was to highlight community projects, deficiencies in education, and general misconceptions about the rainforest that stem from a one-sided media coverage (cf. Ladle et al., 2010). In *Dispossession: The Performative in the Political,* Judith Butler and Anthanasiou (2013) argue that any assumption of power, suppression, and protest always correlates with the performative act of

[13] Due to language barrier, the COVID-19 pandemic, and hurdles in reaching remote areas of the rainforest during these times, most accounts featured are of a scientific nature.

speaking, moving bodies through space, and interaction with others. The cultures come together in accordance with certain sets of values.

> And some set of values is being enacted in the form of a collective resistance: a defense of our collective precarity and persistence in the making of equality and the many-voiced unvoiced ways of refusing to become disposable (J. Butler & Athanasiou, 2013, p. 197).

Thus, through moving bodies through the virtual space (i.e. walking), these bodies become equals and capable of contact hypothesis intergroup exchange. One limitation of *Into the Rainy Woods* with regards to contact hypothesis is a lack of reciprocity that allows for a more direct exchange, a dialog, and room for questions. Through that, the participants become even more involved. Further, the project only gives a limited insight into the possibilities of virtual encounters as it is, at this point, offers a great variety of accounts. A study on the effective of both the creation of empathy and actions resulting from it could be included in the future. As Borawska et al. (2018) note,

> preliminary tests of the virtual environment developed for the purpose of implementing an experiment aimed at assessing the impact of stimuli of various emotional intensity contained in a three-dimensional message prepared for the needs of a social campaign on road safety, indicate that this is a very promising direction for examining the effectiveness of media messages (p.1632).

Drawing from Fearnside (Kausch, 2022e), activism plays a key role in future changes when it comes to political implications and policy making. To facilitate the involvement in political action, the website could include tips as to how people can get involved. Further, the "support of authorities" that is essential in contact hypothesis is needed to help facilitate a positive intergroup encounter (Grim et al. 2005).

For future purposes, this could be achieved in working with a translator or interpreter on site to facilitate the telling of the stories of people in the region that do not speak Portuguese or English. Further, contemporary stories – both written and oral – as well as cultural productions, music, and reports about indigenous craftsmanship could be added at a later stage.

Although *Into the Rainy Woods* does not incorporate all aspects that are necessary for contact hypothesis, empathy driving elements are apparent through the incorporation of different forms of

media (cf. Keen, 2006). The empathic effects and whether this project is successful in eliciting the desired responses could be measured in an experimental set-up at a later time, in which participants are questioned before and after they have experienced the virtual walk through the Amazon. In such a study, an in-depth discussion on individual and group identity, culture, and the politics of difference, which were not the focus of this project, could be discussed at a different time. Similarly, Game Studies could be considered should be project be realized in a full AR/VR immersion.

The Internet offers opportunities to facilitate global intergroup encounters to create more empathy and facilitate contact hypothesis. Scholzman et al. (2011) draw structural parallels to the Greek agora:

> From the Greek agora to the Habermasian public sphere, the public commons is a space, open to all citizens, where political discourse and contestation take place; where citizens gather to discuss and possibly influence public policy; where they inform each other about relevant facts and share and debate their preferences. …The Internet has added a new commons, a virtual space for citizen communication (p. 121).

Whether the information on the Internet is always factual and who does or does not have access to the World Wide Web (cf. Singh, 2015) are crucial questions that should be addressed at a different point should the project be realized. However, in principle, the Internet does offer a space for the world population to come together and share ideas, stories, and different perspectives to protect the rainforest and its inhabitants and simultaneously could allow for what Brecht (2002) was already calling for in the utilization of the radio: reciprocity.

8. Conclusion

New forms of media give us new opportunities for storytelling and with them new ways of conceptualizing the world around us – and worlds that are not a direct part of our own perceived world, such as the Amazon rainforest. All narratives and stories that are being told serve as a perspective, a different nuance of a vast, culturally, and naturally rich environment that stretches across nine countries, giving a home to millions of people who speak over 300 different languages (World Bank Group, 2021), millions of species, and billions of experiences that I could never even begin to try and convey.

However, achieving empathy and intergroup contact could be key drivers to combat climate change and deforestation in the Amazon region. Instead of just frightening news stories, a combination of media contents and modes of storytelling could allow for a better understanding of the subject matter and allow for better intercultural exchanges.

This project has the ambition to give a fraction of an insight into a world that most know little to nothing about. I aimed to offer different angles and shades of the rainforest that in news coverage is often represented as one-sided. With more funding available and advances in metaverse, VR, and AR technologies, the project could be realized as a full immersion into the rainforest in the future.

All parts were shot, produced, and post-produced in a manner that allows for a future implementation in VR, AR, or a metaverse platform. Ideally, these parts can be taken and assembled at a later stage to create an immersion into the rainforest. Adding more media contents is equally important as it is the aim of *Into the Rainy Woods* to offer many different perspectives to really allow for a nuances idea of this place to form.

Reciprocity is key in intergroup contact, which can further the creation of empathy. Hence, future projects could include the incorporation of a discussion forum. Whether or not this should be moderated, should be considered.

In order to really measure the effects of this project on increasing empathy, a study should be included, e.g., through the use of a pre- and post-exposure questionnaire as well as fMRI imaging, as suggested by Fan et al. (2011).

According to Sale (1977) the woods will "never be anything in itself other than a forest, a place where one is liable to become lost, a place where princes never live but woodcutters often do, and witches and wolves may be found" (p. 383). Even though the final production does not offer a full immersion into the rainforest, I hope some of the stories told will offer new perspectives to people, a new approach to the subject matter, which can possibly lead to more engagement and finding solutions to protect the *Rainy Woods.*

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Annexes

Fairy Tales

The Origin of Rain and Thunder

A fairy tale adapted from Tales from the Rain Forest, written by Julia Kausch and read by Mariana Bolza.

Bebogotti was one of many skilled hunters in his village that had a whole group who, together, went hunting every day. On this particular day, they went deep into the woods and found themselves passing a tapir. They used their combined skill and slaughtered the animal – it standing no chance to run away from their bows and arrows. Once they had slain it, the men quickly started to skin it and Bebogotti took it upon himself to take the entails and wash them in the river. By the time he returned, however, he found that the other hunters had taken all the meat off the carcass and divided it among themselves, leaving nothing for him.

Bebogotti was furious and insisted on his fair share of the hunt. The others, though, just laughed at him: “What are you going to do?”, they asked with smirks on their faces. Bebogotti ran off in anger, their laughter chasing him out of the woods and onto the meadow, where he lived. Looking down at his hands, he notices that he still had the tapir’s blood. Still furious, he decided not to wash them, but to keep them bloody as a reminder of his friends’ betrayal.

He stepped closer to his house and called his wife, who came running out immediately. “I will cut your hair, take a seat”, he proclaimed, pointing to a little tree stomp. Bewildered, she stepped back: “Why?”, she asked. “Because I said so”, he responded. Hesitant, she took a seat in front of him and in an instant he started cutting her hair. When her hair was all gone, he took a shell from the nearby river and sharpened it on a rock to use it to give his wife a clean shave, leaving only a small triangle in the center of the crown of her head. Once he finished his wife’s head, he continued with his children’s hair. Lastly, he asked his wife to cut his hair in the same triangle shape as he had done theirs.

After she was done, he ran off back into the woods without saying a word to find seeds from the genipapo and uruçu plants. Back at the village, he grounds them into a fine powder. The genipapo

soon turned into a black paste, while the uruçu turned into a thick, red liquid – like blood that had clotted. Satisfied with the results, he dubbed his fingers into each pot and painted his face and upper body with it. He seemed to be in a frenzy, his wife and children watching him in horror. When he was done with his own body, he told them it was their turn. His wife asked again: "Why?" "Because I said so," he answered like he had before. When all was done and everyone's body and face was painted, they looked like wild animals.

"I am hungry and will go hunting. Not in the woods, but up in the sky", Bebogotti said. Though his wife begged him to stay, there was no point in pleading with him. "When the sky turns black and the rumbling starts, go inside," he said and left with a weapon in hand that he had quickly fashioned from a jatobá tree that was now covered in paint and the tapir's blood.

Under roaring shouts, he started climbing the hill. The other hunters, thinking it was a wild beast, were instantly on alert. Bebogotti's shouts started to sound like roaring thunder, and the men climbed up the hill after him to hunt what they thought to be an animal. Bebogotti took his new weapon and summoned all his strength which accumulated in a bright light that flew out of the end of his weapon straight towards the men. Down in the valley, the villagers witnessed the spectacle in awe and shock. Up on the mountain, the men got ready to kill Bebogotti who responded in shooting another lightning bolt. Fearful and forgetful of Bebogotti's words, his wife and children ran with the other villagers instead of hiding in the house. The men on the hill continued to fight him, leading Bebogotti to summon the biggest lightning bolt yet that instantly killed all hunters. Fortunately, Bebogotti's wife and children were safe because of their shavings. Bebogotti continued to climb higher and higher until – finally – he turned into rain and lightning himself. The shavings and painting had protected him and his family and the tribe has upheld the tradition of shaving and paining ever since.

Dorson, M., & Wilmot, J. (1997). Tales from the Rain Forest: Myths and legends from the Amazonian Indians of Brazil. Ecco Press.

The Brightest Water Lily

A fairy tale adapted from Tales from the Rain Forest written by Julia Kausch and read by Mariana Bolza.

The moon was strong – a shining warrior in the night's sky that illuminated the surrounding rain-forest during most of the nights and occasionally made his way down to Earth to seek out maidens to marry. His wives could be seen shining as bright stars alongside him, twinkling ever so lightly. One of them is Nacaíra – the fairest maiden of the Maué tribe, flanked by Janã, who was ever more delicate and came from the Aruaques people.

The old man is sitting in the village, surrounded by eager ears soaking up the story, their eyes shining in the light of the full moon. The village was situated right next to a big body of water that was covered in big water Lillies whose green leaves were streaked by blooming flowers by the name of Vitoria Regia. The flower tells the story of their tribe, the old man explains, among which a girl used to live. Her name was Naía, who was the daughter of the chieftain.

She had heard tales of the power of the moon and his heroic stories. Secretly, she had always imagined him as her husband. In his light, she could admire her own beauty in the nearby pond. Over the years, her obsession grew stronger and stronger – leading her to fail to take notice of any of the handsome young warriors in her tribe, declining any offer for marriage.

In the hopes to connect to the moon, she would seek out his light every night – always trying to find new spots that were more exposed to his light and dreading those nights when the clouds were keeping her from him. Her favorite places were those close to the water as she could see her own face alongside his. Asking, begging, pleading in sweet lullabies, she would try to contact him to speak with her. The moon, however, remained indifferent. Naía, to the village people, seemed more and more like a lunatic – mad from the moonshine.

Her nightly endeavours left her beautiful skin scarred, her singing made her seem like a drunkard – in the minds of the village, she was lost. Her father, the chieftain, promptly ordered all shamans in the area to create an elixir to save his fair daughter. Once the elixirs were made, the chieftain

summoned his daughter and started the ceremony, in which the whole village and several shamans partook. All elixirs and hour-long dancing by the villagers were to no avail. Naía could not be disenchanted by the moon and was further traumatized by the event. It so happened that only a few days later, she wandered off into the rainy woods. It was a full moon and she set out further than ever before, on the search for ever more moonshine. Singing louder and louder in houling tones, she finally reached a shore that was unknown to her. Called by the reflection of the moon, she jumped into a big pond of water without hesitation. Not knowing how to swim, she paddled frantically to get closer to the light. After a while though, she was exhausted and could not hold herself above the surface. The moon – it seemed – did not want her as his wife to be turned into a celestial star. To honor her death, he thus turned her into the biggest water star. The Vitoria Regia. The water lily that only blooms during nightfall.

Dorson, M., & Wilmot, J. (1997). Tales from the Rain Forest: Myths and legends from the Amazonian Indians of Brazil. Ecco Press.

The End of Eternal sunshine

A fairy tale adapted from *Tales from the Rain Forest,* written by Julia Kausch and read by Mariana Bolza.

In the beginning, there was no nighttime, no Vitoria Regia, no jaguars or bats, neither sunrise nor sunset, no stars or moon. The sun was scorching the delicate petals of many flowers, day in, day out and night was a thing of dreams. There was a Great Warrior Serpent – an Anaconda, that lived in the Madeira River.

His daughter – the beautiful princess – had married a man from a village near the river, where they lived happily, albeit in dread of the never-ending sunshine

Her husband, working hard and farming the land with local crops such as corn, mandioca and sweet potatoes, struggled to keep up the work because the endless sunshine kept them from cooling down and getting some much-needed sleep. All the while, the princess struggled to enjoy the beautiful things that – in the scorching sunshine – reflected with such brightness that it hurt her eyes.

Out of love to her husband, who she saw struggling badly during the even more exhausting harvest season, she had an idea: As a child, her father had once taken her to a place of darkness, peace, and tranquility that could help her husband get some sleep and herself to finally enjoy the vibrancy of the day.

She made a plan to send for her father, who could provide them with NIGHT. Her husband, thinking his wife was suffering from heatstroke, did not believe that such a bliss could exist in a world that was dominated by light. Finally, she convinced him to send three of the most skilled village men to seek out her serpent father. Otherwise, he was afraid, his beautiful wife would lose her sanity.

The three men took to the rivers, paddling past Jacaré that were hiding on the shores of the riverbanks, lurking and awaiting prey. Without the cover of the trees, they were directly exposed to the sun and their skin started burning. The stopped at a felled tree, the location previously pointed out by the handsome village man. They spotted the anaconda, asleep in the tree in a hammock that was made from miriti palm.

The old snake, known to be cranky, had just devoured a tapir and thus needed his rest. But the three village men were not to be stopped and, to his distress, awoke the serpent. “Who are you?”, he asked?

One of the three answered: “Excuse the disturbance, but your daughter is in great need. She sent us here to ask for your help. She and her husband are on the brink of madness due to the never-ending sunshine. She said you would be able to help retrieve the Night from the bottom of the river.”

The serpent was on alert: nobody needed to convince him to help his child who was in need! He flung himself off the tree, instructed the three men to await his return, dove into the river, and descended into darkness.

The three men, baffled by his sudden revitalization, did as instructed. After an hour of impatiently pacing along the riverbank and calling out for the snake, he finally returned, balancing a fruit from the tucumã tree on his head. The snake passed the fruit over to the men, who, after inspecting it, noticed a small whole on its top that had been sealed with a dark residue.

In a sharp voice, the snake said: “Under no circumstances are you to open the nut – only my daughter has the power to contain what is concealed in it!”

With that, he made his way back up the tree and fell asleep peacefully in his hammock.

The three men, joyous and too eager for some rest, untied their boat and started their journey back to the village. With no water and a long journey in the scorching sunlight still ahead of them, they discovered sounds coming from the nut – as if it was calling on them to open it. It said: “Shaaaay - tem, tem, tem underlined with a sweet nighttime lullaby. While hesitant at first, they agreed it was the best course of action to open it.

Upon opening it, night broke loose: the sounds of crickets, frogs, *murucutús* as well as the jaguar’s hiss escaped the big nut. With night, the stars, moon, and bats covered the sky.

The princess, still in the far, knew instantly what had happened: Night had fallen upon them. Her husband, who had thus awoken, saw himself face to face with a new creature of the night: a jaguar, and noticed the forest had gone pitch black. Barely escaping the claws of the jaguar, he ran with his wife in search of the three men. “All is lost! There is no more sunshine!”, he said.

But the princess knew what to do: As soon as the three men arrived with the tucumã nut, she took it from them and – being a sorceress – concealed in the night and turned all three men into monkeys for having disobeyed her father.

Night was born and from this day on shared its presence with the sun. From this day forward, the princess and her husband could watch the beauty of the new species every night and fall asleep to

the sounds of the frogs and the crickets, while a new flower – the Vitoria Regia – opened its petals for the stars.

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Reporting from within

An Interview with Alfredo Lopes of Brasil Amazônia Agora

This story is set as follows: A place of swampy despair, filled to the brim with strange animals with sharp fangs or poisonous skin, and in its midst a bunch of white people who are trying to build an opera house. Of course, this story, **Fitzcarraldo**, directed by Werner Herzog, is a fictional one, albeit the story about rubber barons and their need for the pleasures of the European – then postulated to be the more civilized – culture reflects the twisted reality of the late 19th century that led to the construction of a majestic opera house in the middle of the jungle: Manaus, Amazonia. Another account, set in the beginning of the same century, sheds a very different light on the majestic forest: a place of heavenly delight – that is if you are an explorer. "We are here in a DIVINE COUNTRY," Alexander von Humboldt wrote in a letter from the rainforest addressed to his brother on his exploration through South America. More than 200 years later, the foreign narrative on the rainforest have turned from untouched and frightening natural beauty to and industrial hell: deforestation, extinction, point of no return are just some of the top hits on well renowned news-media channels.

The Amazon rainforest is the biggest rainforest on Earth and encompasses 7,000,000 square kilometers of forest that is crossing 9 countries, the majority of which (a whopping 60 percent) is based within the borders of Brazil. Media coverage from this culturally diverse place does not usually extend across national borders, oftentimes creating a discourse on the Amazon that is ruminating the same facts instead of different angles and perspectives from within the region. Alfredo Lopes is the Portal administrator of the online platform **Brasil Amazônia Agora** in Manaus (not far from where the opera house stands to this day) that delivers daily news updates on topics surrounding the Amazon. The list of authors is as impressive as it is long: scholars in the fields ranging from biology, economy, philosophy, politics as well as climate change advocates. During our chat, he talks about issues, hopes, and the future of the Amazon.

J: *Could you first introduc*e yourself and tell me a little bit about the work you do with Brasil Amazônia Agora?

A: I am an Amazonian affairs writer. My academic background is in philosophy, management and human behavior. I studied and taught at PUC- São Paulo and at USP. The Brasil Amazônia portal is now the result of a collective decision by professors, entrepreneurs and thinkers from the Amazon, concerned with disseminating the point of view of those who live here and work here. One of our biggest problems is to establish competent and collaborative communication for the understanding and sustainable management of the Amazon.

J: What are the greatest threads to the rainforest at the moment?

A: We understand that the best way to preserve the forest is to develop programs and projects with low carbon emissions. We have ongoing projects with IDESAM, and some initiative supported by the government and the United States through American companies in the Amazon. We have startups stimulated by Grupo Bemol with the CEO Denis Benchimol Minev in the area of Bioeconomy. However, we need more domestic and foreign partnerships to create economic models that do not entail deforestation. These partnerships are mainly for the qualification of human resources and investment in regional technological centers.

J: Soy bean production, cattle farming, and trade plays a major part in the deforestation of the rain forest, is anything being done to curb the growth of this market or regulate it?

A: This is a public policy of the current government, to expand agribusiness. It is necessary to change this public policy by an electoral decision. At the same time, we need to publicize the economic and environmental benefits of a sustainable economy. The Amazon 4.0. More science, more technology and more innovation.

J: How has the situation in the Amazon changed over the course of the last 10 years, with global leaders trying to ease deforestation in the rainforest?

A: There is a positive side to international pressure to combat deforestation and condemn the expansion of the agricultural frontier. Public financing in Brazil even sponsor companies that promote deforestation and often child or slave labor. This too deserves organized international pressure, especially from serious non-governmental entities.

J: How do national (and more regional) politics factor into this?

A: Our challenge is to promote the clarification of public opinion. We need to influence public opinion in the direction of the low carbon economy for the Amazon mainly. Cutting down the forest to raise livestock is unacceptable stupidity.

J: With many different threats to wildlife habitat and the global climate, which do you see as the single most important thing to focus on?

A: We need to create a new awareness of climate change on a global scale. This should start in preschool, in the family environment. It is necessary to expand the options for conveying this new awareness. Developed countries are not taking consistent and efficient measures. It's a lot of speech and little practice. And the best way to help preserve the Amazon is to invest in this new awareness challenge. We must all be guardians of the forest. It takes love to take care of the Amazon.

J: What representation of the Amazon region and issues/positive things surrounding would you like to see from the world media?

A: The world media plays a very important role in this awareness process. In addition, it is important to support and publicize all low-carbon economic development initiatives. The Bioeconomy of pharmaceuticals, cosmetics, functional foods, sustainable adventure tourism and cultural and biodiversity research.

J: Has the pandemic played a role in a new spike in deforestation in the past 2 years?

A: Definitely, since the environmental policy in force in Brazil was committed to promoting the exploration of natural and mineral resources at any cost. The environmental authorities themselves were the promoters of this predatory economy.

J: Do you feel like the world has an understanding of what is going on in Brazil or the Amazon in general?

A: The source of the information consumed is second hand. Even foreign correspondents in Brazil usually talk about the Amazon from São Paulo and Rio de Janeiro, which are 3000 km away from the forest. It is necessary to live in the forest to be able to understand its dynamics and rules. We have here almost 30 million people who have met human development indicators at the standards of the poorest countries in Africa. There is a predatory economy in full swing, but there are also initiatives that deserve to be supported, institutions that deserve sponsorship, and researchers and entrepreneurs that need to be recognized.

J: In order to achieve the best case scenario to curb global warming at 1.5 degrees and slow the current rate at which the rain forest is being cut down, what must change?

A: The statements made so far have already provided some clues. On the news portal Brasil Amazonia Agora, scattered in the articles, the recommendations in line with the Sustainable Development Goals are found. We have to move forward in solid partnerships that are committed to the present and future of the Amazon. The challenge is to expand the communication of sustainability, support for environmental services in the Amazon and the initiatives of a socio-economy towards climate change, of new zero carbon economic and energy matrices.

The Rainforest of the Future: How biotechnology and education can make a difference

An Interview with Augusto Rocha, Universidade Federal do Amazonas

Manaus is one of the stranger places to visit in Brazil – an industrial island in the middle of a large, dense forest. Its harbor, the port of Manaus, faces the Rio Negro, an arm of the Amazon River, whose water is giving off an eerie, pitch-black shine. As you descent into Manaus, it is hard to see which of these rivers is the Amazon. You do not really see it until you see it: an endless body of water that – due to the Earth's curvature – seems to only be marginally longer than it is wide, making the smaller rivers surrounding it seem trifling. Even during the dry season, the Amazon ranges between 3.2 to 9.6 kilometers in width, which almost quintuples to up to 50 kilometers during the rainy season between April and December (WWF).

As the plane touches down, any trace of the forest surrounding the city vanishes; in its place only murky water and moist air that add to the very unpleasant and unique smell that will forever be

mentally tied to it. Manaus is a strange place, not just olfactory, but because of its history that is tainted with exploitation through colonizers, international governments, and companies and, as a result, the unique position the city found itself in. Just past customs, visitors find themselves in the airport shopping aisles that usually offer items such as sunglasses, sim cards, or hand luggage. In Manaus, you get none of this. Instead, arrivals are faced with numerous options for washing machines and other household items that stand in stark, comical contrast to what one wishes for after a long flight. Who has the urgent need to buy a washing machine on arrival? Nobody, of course. And it is not just washing machines, but radios, television sets, calculators, or watches. To understand this conundrum, one has to look back a few decades – namely to the year 1967, when the city was made a free trade zone to facilitate the establishment of an industrial hub. And it worked: By 1990 the New York Times called the city the "largest manufacturing center after São Paulo" with a huge spike in factories and population (Broke, 1990). As a result, most electronic appliances are assembled and/or manufactured in Manaus and from there shipped to other parts of the country or continent. "[The reason that] Manaus has this industrial area is because this import zone imports goods and raw materials, mainly from Asia, some from the US, some from Europe. Manaus produces motorcycles, TVs, cellphones, electronic goods for the consumer market. We import a lot of raw materials [mainly from Asia, the US, and some from Europe] and convert and produce the cellphones etc. here and sell them all over Brazil. [...] In terms of export, Manaus is not very big," Augusto Rocha, professor at the Universidade Federal do Amazonas, explains. After his PhD in Transport Engineering, he continued as professor for engineering with a focus on construction, logistics, and transport systems as well as the economics behind them. He went on to teach Innovation Technology and Biotechnology and ventured into the business sector, working as the director for an industrial association and consultant. In his work, he addresses questions like: How can goods from the Amazon rainforest be used in new medicines and products? How can the infrastructure in Manaus be enhanced and made more efficient? And how can the region be protected in order to flourish, both environmentally and economically? "The big issue in Brazil about the Amazon is not the law. We have a lot of laws. It is about how to enforce the law. There are regulations and then how much you can trust in them. It [the rainforest] is so huge, there are no people in the habitats, no nothing. How do you make the law work? When we talk about big cities like Manaus, like Campo Grande, like Porto Velho… it is easy because it is a big city, so it is easy to control", he says. But in provincial areas, smaller cities like Hamaita, it is hard to enforce any laws

as the military is unable to enforce the laws without any special authorization. The jurisdiction lies with the local police and IBAMA, the latter of which is the regulator that takes care of the environment, as he explains. INPE (Instituto Nacional de Pesquisas Espaciais) the National Institute for Space Research, is alerting authorities to illegal deforestation.

The Amazon rainforest in and of itself is a poor region of Brazil (Skillings, 1984). That is why, according to Rocha, technology is the key component to helping with issues surrounding the rainforest – locally, regionally, and globally. "We need to use science, technology, and people from everywhere to develop the region together, with local resources and under local leadership. This way, we create business and resources – development for the people who live here, because they are starving. It does not make sense to have so many people in the middle of this huge forest with so much potential." The abundance of species, animals, and potential for biotechnology make the issues surrounding poverty and education even more pressing – for both the people and to drive scientific discoveries. Just roughly 100 years ago, western countries began the "secretive exploration of oil, minerals, and likely locations for rubber plantations in the Brazilian Amazon jungle" (Galey, 1979, p. 261). This western-led exploration and exploitation is what Rocha deems dangerous: "We had rubber about 100 years ago, but these days it is fish and many other products that are being copied or moved to some other place," he explains. Animals, plants for medicine, and biotechnological development are being taken and, in turn, technological advances are developed elsewhere, leaving the Amazon region, and Brazil as a whole, behind. "Right now, the approach is to understand a new spider, for instance, the way in which it produces a net, which itself is bulletproof. They [scientists] understand everything in terms of how it works. They can then take some eggs, move them to water and reproduce these nets elsewhere, so there are no profits … for the Amazon." He pauses and adds an analogy: "It is a kind of piracy from around the world. Even though Brazil produces coffee, coffee is not originally from Brazil, it came from Ethiopia. It does not make sense in 2021. We need to find a new way of doing these things." Similarly, China is now the largest producer of the Tambaqui fish that is native to the Amazon region.

Rocha sees the biggest opportunities in biotechnology in medicine, materials, and the cultivation of fish in aquafarming. "The export potential is huge, and it is responsible regarding the environment." For Rocha, branding and cultivation of specialties such as French Champagne or Argentinian Rump Steak are key to driving exports of certain goods: He asserts that honey, Brazil nuts, and

açai have to be staples in the Brazilian export portfolio. But how can Brazil get there? “I believe we have two approaches: The first is basic education to develop the people. The other issue is high-tech. How to incorporate international research centers together. INPA, the local authority in the Amazon, is doing research together with institutions in Germany, the United States etc. to address the issues in the forest and to make new product. But not for basic research or to understand the opportunities.” Brazil is highly regulated when it comes to deforestation and export, however, there are workarounds that often render these regulations obsolete – that is, for certain groups higher up the income ladder (Capelari et al., 2020). Enforcement, especially under the Bolsonaro government, has declined rapidly, the regulations are often circumvented, and counterfeit permits are on the rise (Carvalho et al., 2019). Education, according to Rocha, is key to combat this issue: “If we improve the science and knowledge locally, these people will take care. If I need the forest, I will take care of it. … The question is: What is the value to myself? If I am starving, and I cut this tree and receive 2 or 3 US dollars, I have solved my problem for today. So if you can only do one thing, it is to develop science and technology locally. These people will take care of the region.” Further research led in conjunction with local populations will help develop the region and drive the economy in these still underprivileged areas. And there is a lot that has yet to be discovered: “We probably know more about the moon than we know about the Amazon,” says Rocha. Maybe it is time to shift the focus back from finding new Worlds to inhabit and back to what is worth saving and improving ours. “Let’s work together in the Amazon and in the world. This will work towards a common good not just for yours or ours but all of ours.”

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