The Potentials and Challenges of Using Artificial Intelligence in Literary Creation: A Study of the Aesthetics of Dramatic Structure and Content in *Permeation*, an AI Generated Drama

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Abstract

The present study aims to examine the use of AI applications – depending on prompts powered by language models – in generating creative dramatic texts by analyzing the aesthetics of dramatic structure and content in *Permeation* (2022), a drama generated by a version of Generative Pretrained Transformer (GPT-2) in the Czech Republic. The play is the product of the collaboration of researchers: linguists, computer scientists, and drama experts whose contribution to the process of writing the play was only 10% while 90% of the written text was done by the virtual dramatist, the machine author, in English. The present research adopts an analytical, descriptive approach to investigate the validity of AI in literary creation and explore the cultural aspect of the product content in relation to the dramatic structure of *Permeation*. The study relies on Henri Bergson's and John Dewey's concepts of aesthetics relevant to literary production to explore the potentialities and challenges of creating computer-assisted dramatic texts, bearing in mind the cultural impact of literary works as reflecting the cultural environment which produces the texts. The study also discusses the challenges concerning authorship, the limits of the legal liability of the text generator and the circulation of biased ideologies that can orient readers and influence the shaping of the cultures in the targeted societies.

Keywords: Artificial Intelligence, aesthetics, dramatic structure, cultural content.

امكانات وتحديات استخدام الذكاء الاصطناعى فى الإبداع الأدبى: دراسة لجماليات البناء الدرامى والمحتوى فى مسرحية "اختراق"المكتوبة باستخدام الذكاء الاصطناعى

المستخلص:

يهدف البحث إلى دراسة استخدام تطبيقات الذكاء الاصطناعى فى خلق نصوص مسرحية ابداعية من خلال تحليل جماليات البناء الدرامى و المحتوى فى مسرحية"اختراق"(٢٠٢٢) كنموذج لمسرحية تمت كتابتها باللغة الإنجليزية باستخدام نموذج مولدالنص الآلى(GPT-2) وهو أحد نماذج تطبيقات الذكاء الاصطناعى الذى يقوم بتحويل النموذج اللغوى الآلى لكاتب مسرحي افتراضى. كانت مشاركة البشر فى تأليف ومراجعة نص مسرحية "اختراق" بنسبة١٠% فقط عن طريق فريق تأليف من مجموعة من الباحثين فى مجال اللغويات والبرمجيات والمسرح بدعم من الوكالة التكنولوجية لجمهورية التشيك. يعتمد البحث فى الدراسة وفى النتائج المستخلصة على المنهج التحليلى الوصفى بهدف تقييم دور النموذج الآلى فى انشاء نصوص مسرحية وعلاقة النص المنتج بالمحتوى الثقافى و مابه من ايجابيات وسلبيات بناء على رؤية كل من هنرى بيرجسون و جون ديوى فى علاقة جماليات الابداع الادبى و خلق النص الأدبى أو المسرح الارتجالى بالبيئة الثقافية والاجتماعية و التجربة الإنسانية. كذلك يناقش البحث أوجه القصورفى المنتج المستخرج ثقافيا وفنيا وربما التنبؤ بما يمكن تحقيقه مستقبلا فى مجال الابداع الأدبى من الناحية الفنية. وفى هذا الشأن يعنى البحث باشكالية كون الفنون تعكس البيئة الثقافية المنتجة لها ، لذا يجب الأخذ فى الاعتباردورالشركات المصنعة فى نشر ايديولوجيات ثقافية ايجابية وسلبية وتقديمها للجمهور من خلال تغذية النماذج اللغوية بمحتوي ربما لا يخضع لجهات رقابية وتنتج عنهانصوص يغيب كاتبها ولا تخضع للمسائلة القانونية، مماله آثار على بناء الإنسان وتحديد توجهاته الثقافية.

الكلمات المفتاحية: الذكاء الاصطناعى، جماليات البناء الدرامى،المحتوى الثقافى

Introduction:

The amazingly fast spread of Artificial Intelligence applications in the various aspects of contemporary life has led to the rise of questions focusing on the challenges, fears as well as opportunities for the use of AI to replace or aid humans in undertaking and accomplishing a variety of tasks and missions which were thought to be restricted to a human agent. Most of the tasks that are allocated to automated machines depend on endowing the machines with the ability to communicate with humans by relying on language models with massive linguistic input that covers a variety of situations relevant to the required tasks. The present research postulates that the use of such models in the creation of dramatic texts proves different as the dramatic contexts produced have contexts widely different from the contexts that are fed into the machines. This is because literary creation requires more than linguistic competence, which is the sole ability that a language model like GPT 2 (Generative Pretrained Transformer) has. This hypothesis is to be examined in the present study by analyzing the form and content of *Permeation*, a dramatic text generated by GPT2 where the role of the virtual author constitutes 90% while the role of the human collaborators constitutes only 10% of the process of dramatic creation. In the process of analysis, the study adopts the respective approaches of John Dewey and Henri Bergson where they explain the relation between literary creation and aesthetics. Choice is made of Dewey and Bergson because their approaches to aesthetics and literary creation prove they have much in common and they focus on the process of literary creation, which is the core of the present research. de Boer (2022) notes that human creativity is Bergson's main concern: "The center of his thinking is creative consciousness" (p.5). Antliff (2024) describes Bergson's philosophy of aesthetics as "process-oriented" (p.3). Similarly, Dewey is concerned with the creative process which, he believes, is not accessible to everyone. The titles of Dewey's works, *Art as Experience* (1980) and *Creative Intelligence* (1917), clearly reveal his focus on the process of artistic creation. McClelland (2005) explains that Dewey's emphasis on the process of creation entails an emphasis on the aesthetic dimension of the artist's product which is a reflection of the artist's vision and experience (p. 45). According to Colton et.al

(2009), the same concern with the process of production must be considered when judging a work of art produced by machines (p. 13). Their defense of machine creativity paradoxically implies that an understanding of human creativity is a prerequisite for the advancement of computational creativity because it replicates human creativity. The same concern has been the rationale for the current study which discusses the potentials of AI in the field of literary creation by applying the aesthetic criteria set by Bergson and Dewey.

The present paper, which aims to explore the aesthetics of literary creation and the use of AI in the field of literary creation by analyzing *Permeation*, a drama generated by GPT 2, is divided into three sections. Section one provides a background on Artificial Intelligence, the definitions of the terms that are basic to the study, and an elaborate explanation of Dewey's and Bergson's concepts of creation and aesthetics. Section two includes the analysis of *Permeation* as a machine-generated drama by discussing sample extracts from the play. Section two also focuses on the challenges met with in the process of dramatic creation as elaborated on by members of the Czech group in charge of the project. Section three provides a conclusion followed by the list of references.

Artificial Intelligence, Human Creativity and Aesthetics:

From the onset of the use of AI in the different fields, a problematic relation has existed between literary creation and AI. An ongoing debate on the possibility of AI matching the creative human ability in the field of literary creation has been witnessed. Supporters and opponents of both sides of the argument have to find adequate criteria on which to build their views. They also have to provide tangible evidence by referring to examples of works produced by AI and exploring the challenges as well as the potentialities of relying on the role of AI in the process of literary creation. Bardsley (2024) refers to an instance of extreme human objection to the manipulation of AI in the field of literary production with limited human intervention; the incident he narrates took place in Hollywood which witnessed a strike by authors as well as cinema and TV producers against the use of AI tools in creative writing. The mentioned incident demonstrates that, until recently, the role of humans is considered indispensable and that there may be sound reasons for humans' being concerned about the

limited potentialities of AI. Definitions of literature, aesthetics and Artificial Intelligence by specialists are, obviously, necessary to start with even if they are considered clear terms for intellectuals interested in reading and appreciating literary texts.

In "Literary Aesthetics and Literary Practice", S. H. Olsen (1981) states that the distinguishing element of literature is the texts' including "properties [that] constitute their aesthetic nature and thus their aesthetic worth" (p. 521). In other words, aesthetic qualities are peculiar to literary texts but, one must add, they do not merely pertain to linguistic polish. This is because the distinctive qualities of a work of art also relate to the process of appreciation, the point where the process of creation may be said to have achieved its function. This explains why Lamarque (2008) assigns the readers of a work of art a task in the creative process, namely the process of appreciation without which the creative process is deemed incomplete (p. 14). The presence of a function, which is basically aesthetic, thus, necessitates the existence of an aim and a will to achieve literary creation; it is a conscious process which until recently has been a challenge for AI to replicate. Scientists who aspire to achieve computational creativity on a par with human creativity are still unable to reach a scientific explanation for the process of creation. Until recently, arguments supporting the hypothesis that computers can be as creative as humans, however, do not provide adequate evidence that there are further possibilities to equal human creativity in the field of literary creation. A defence of computational creativity is witnessed in *AI Magazine* where Colton et al. (2009) seem to deny the role of intuition and inspiration in the process of artistic creation. Their argument in favour of computational creativity, however, lacks sound evidence, for it refers to future possibilities rather that existent examples. Their reference to creativity, intuition, and inspiration as unclear concepts indicates the untenability of their argument and proves that a philosophical rather than scientific explanation of the mentioned abstract terms is necessary. This necessitates a close inspection of the work of outstanding and renowned theorists who tackled the concepts of aesthetics and artistic creation like Bergson and Dewey as well as an analysis of a play written by a machine not a human author. However, before providing a philosophical explanation by exploring Bergson's and Dewey's theories of aesthetics or artistic creation, one has to provide a definition of Artificial Intelligence; only then the

relevance of its being compared with human intelligence will be obvious. Luis De Miranda (2020) defines Artificial Intelligence as follows:

> AI is a human-designed digital technology that facilitates the identification of meaningful patterns within bodies of data through the use of computers, and the prediction of future patterns, in order to gain insights that facilitate an automated action …. an essential part of intelligence was left behind in their endeavours, namely a relationship to creation and truth. (pp. 598- 599)

The definition above, underlining that AI is *human-designed*, makes it clear that the argument is still in favour of humans. This is, again, elaborated on by De Miranda (2020) who relates the above definition to the concept of "crealectics", a term he coins, as follows:

> We propose to call "crealectic" the existential form of consciousness that is aware of acting as an engaged person upon a world of multiplicity and possibility, with the ideal of co-creation in mind. Crealectic intelligence cannot be emulated by a non-biological AI because it is grounded in desire and felt sublimity. (p. 602)

The keywords here are *non-biological* and *desire*, the second of which literally entails will, choice, and an emotional drive. The relevance of Dewey's and Bergson's views on literary creation becomes obvious when one considers the *biological* qualities that AI lacks. Of these qualities human volition or will, choice, emotion and individualized experience are the most important ones in the process of literary creation. In AI applications, the absence of volition, intentionality, or emotions marks a vast difference between man and computer, machine and human, for robots do not have wills of their own though they may represent a simulation of human mind. Nor do they have experience, a human characteristic which is discussed in detail by both Bergson and Dewey. Normally, lacking these qualities makes AI applications, mainly automated language models of which GPT 2 is a well-known example, incapable of matching human creation. This is the hypothesis that the present research will demonstrate. The main reason for this is that the automated language models merely reuse data previously fed into the model's structure by combining these language units in apparently new forms or structures. What is even more alarming, Perrigo (2021) warns, is that the datasets of language models will probably include biases, like racist tones, which are

originally based on human biases transmitted in the data input. These are some negative repercussions on culture that show how the use of AI applications produced by mammoth technological companies or entities may serve certain ideological or political agendas or propagate ideas from particular cultures at the expense of others. It should be noted that *Permeation*, the play under study does not include implicit or explicit ideological biases probably because of its fragmentary content and its experimental nature as the second play in a project to create dramas by the collaboration of humans and a machine author.

Since GPT 2 is the language model that is used to replace – or rather aid – human authors in producing *Permeation*, the play under discussion, the writing of the full term of the abbreviation, GPT 2, proves necessary before analysing the play. The abbreviation GPT stands for Generative Pretrained Transformer and the number (2) stands for the second version of the language model application developed to generate texts replicating human language. The *Transformer* is *trained* to *generate* texts depending on a huge linguistic corpus assembled from human language by aping its semantic and syntactic structures to suit various contexts. Klenk (2023), commenting on the Czech project, makes the point that GPT 2 as a generative language model can easily tackle similar themes by using similar language. However, a different and more sound opinion is provided by Attard (2018) in his reflections on aesthetics where he stresses that language cannot be the only criterion when appreciating or judging a literary work (p. 86).

Attard's opinion brings to mind Bergson's reluctance to accept that the association of ideas is behind the creative process. According to Bergson, human experience is the main component of artistic creation. Perri (2014) summarises Bergson's view thus:

> Bergson's philosophy of memory entails a rejection of traditional associationist theories of mind…. the mind and the entirety of one's past experience form a continuous whole that is manifested differently depending on the demands imposed on us by virtue of the fact that we are alive. (p. 8)

The keyword in the above quotation on Bergson's thoughts is the word *experience* which also figures many times in Dewey's writing on artistic creation. Like Bergson, Dewey focuses on human interaction with the environment, be it natural or social, a luxury which is denied to machines.

In "The Need for a Recovery of Philosophy", Dewey (1917) departs from traditional views of experience and defines it as follows: "it assuredly appears as an affair of the intercourse of a living being with its physical and social environment" (p.7). He believes that it is the interaction with one's surroundings that incites one's emotions and memories and forms one's sensory and mental experience which can, eventually, be expressed in linguistic terms in literary works. In this case, however, language is merely a medium. When one compares the linguistic choices of a human and a machine, one finds that even when machines produce relevant linguistic choices, based on the input provided by humans, they lack the power to prefer one choice to another. It is a choice based on the association of ideas, a mechanical choice without will, emotion or intentionality.

A full explanation of human volition and choice is provided by McClelland (2005) who recapitulates Dewey's argument on the presence of the elements of choice and deliberation in any human action. McClelland (2005) also elaborates on the role of imagination in providing myriad aesthetic possibilities to choose from in order to produce a creative work of art (pp. 53-54). The machine's lack of imagination is another weakness to consider when comparing human and machine authors.

In addition to choice, the reference to human intelligence in the writings of both Bergson and Dewey suggests a comparison between human and artificial intelligence. Bergson's theory of aesthetic creation focuses on intelligence as an integral part of human choice. In *Creative Evolution*, Bergson (1922) elaborates on choice and emphasizes that it involves the use of intelligence as well as instinct: "Now we must show that intelligence and instinct also are opposite and complementary…. Neither is ever found in a pure state" (p. 142). Bergson (1922) explains: "Now a choice involves the anticipatory idea of several possible actions. Possibilities of action must therefore be marked out for the living being before the action itself" (p. 102). The reference to the *living being* is telling. Obviously, choice, which entails the coupling of instinct, a human faculty inaccessible to AI, and intelligence, is the impetus for artistic creation. Choice, in this way, is, for Bergson, the source of both inspiration and innovation in literary creation.

Bergson (1922) also indirectly refers to the aesthetics of influence by asserting that an author needs to highlight the original and

distinguishing qualities in his creation of characters because they will probably trigger a comparison with other characters in previously created works of art (p. 105). Bergson's idea of inevitable comparison with previous works can normally be applicable to the use of AI in literary production. When the task of artistic production is assigned only to the machine author without the participation of a human agent in the process of creation, the product will be a mere replicated copy of a previous *original work* fed into the computer. The product in this case will lack the innovative touches of the human author. One can conclude that the major part of the problem with the machine author relates to the power of choice; unlike human choice, it is only a mechanical choice based on the association of ideas. AI-triggered choice is devoid of the power to *discard* inappropriate choices, like ones that are biased, improbable, incoherent or out of character. On AI bias Iason Gabriel (2018) writes: "With algorithms bias arises.…By under representing or excluding certain socially marginalised groups or subgroups.… This is true of language, which often contains prejudicial associations between certain words". This is the cultural dimension that may be negatively influenced by the kind of information fed into AI applications. Hence, the cultural values in a work of art generated by AI may entail biases or prejudices.

The absence of censorship to judge and govern the content fed into the language model and to monitor unattended to AI-circulated information marks the presence of a cultural threat. The need for the establishment of a legal body to decide on the legal liabilities when the manipulation of certain language structures is meant to orient users' tendencies and loyalties is probably urgent. The crisis also relates to the problem of deciding who are to be deemed the holders of copyright when AI applications are relied on especially in case of artistic creation.

Dewey (1980) seems to voice the same thought about the cultural impact of the choices made in artistic creation in *Art as Experience* where he explains that a literary work expresses meanings and values that are learned from previous experiences (pp. 98-99). Dewey (1980) insists that artistic expression implies a fusion of sensory perception and abstract values (p.103). This means that values and meanings are basic factors to be taken into consideration when creating an artistic piece, for, in addition to sensory perception, the abstract values and meanings are essential for a work to become complete. Clearly,

Dewey focuses on sense perception, or sensory experience, as a main element in artistic creation, a kind of experience inaccessible for the machine author. For Dewey, sense perception is the kind of experience that endows a work of art with a real aesthetic value. This kind of experience is, for Dewey, indispensable to artistic creation and appreciation because it is the source of another emotional experience, namely pleasure, which is the criterion for the aesthetic value of a work of art.

Dewey (1980), who believes that what completes the aesthetic structure of a work of art is the presence of an underlying emotional experience, elaborates on the value of emotions and relates them to the art of drama in particular: "In fact emotions are qualities, when they are significant, of a complex experience that moves and changes… All emotions are qualifications of a drama and they change as the drama develops" (p.41). Dewey (1980) goes on:

> Emotion is the moving and cementing force. … giving qualitative unity to materials externally disparate and dissimilar. It thus provides unity in and through the varied parts of experience. When the unity is of the sort already described, the experience has esthetic character, even though it is not, dominantly, an esthetic experience. (p. 42)

It is worth noting that Bergson, too, believes that emotion is the source of artistic creation. For Bergson, Ryu (2009) asserts, "A work of genius often develops organically out of a unique emotion, which is its seed" (p. 52). Clearly, both emotion and pleasure are part of the aesthetic experience, a belief that most aestheticians seem to be much occupied with:

> The aesthetic elements identified in literature are not simply well-crafted turns of phrase or expressive images…but rather emergent qualities that become salient when appropriate attention is directed to works. There is a kind of perception involved in discerning such qualities and ultimately it is a source of pleasure. (Lamarque, 2008, p. 23)

Like Dewey, Bergson (1922) explores the concept of sensory experience to explain his theory of aesthetics:

> An artist of genius has painted a figure on his canvas…. an infinity of elements infinitely small, presenting an infinity of shades, would be necessary to obtain the exact equivalent of the figure that the artist has conceived as a simple thing, which he has wished to

transport as a whole to the canvas, and which is the more complete the more it strikes us as the projection of an indivisible intuition. (p. 95)

Bergson's reference to the selection of elements of a work of art and to experience, again, proves the validity of the analogy with Dewey's aesthetics. The reference to an infinity of elements to choose from by means of intuition is reminiscent of Dewey's views on artistic creation and the presence of a plenty of possibilities to choose from by means of human imagination. Bergson (1922) holds that "we shall find that consciousness is the light that plays around the zone of possible actions or potential activity which surrounds the action really performed by the living being. It signifies hesitation or choice" (p. 152). One can conclude that Bergson's repeated emphasis on the importance of choice as part of human experience is almost a rephrasing of Dewey's concern about the idea of selection, which is only mechanical and associational in AI. Bergson's concept of human language, which implies selection as well as intentional choice, can be adopted to distinguish it from automated language models.

Bergson (1922) seems to predict the attempts of AI to simulate human use of language when he defines human language in a manner that can help distinguish it from the language produced by automated language models. Bergson (1922) writes "There must be a language whose signs —which cannot be infinite in number—are extensible to an infinity of things. This tendency of the sign to transfer itself from one object to another is characteristic of human language" (p. 166). Probably, the finiteness of signs is the characteristic of language models which makes them inferior to humans, for humans have an *instinct* which allows them to extend the finiteness of signs to *an infinity of things.* However massive a language model can be, it has limited capacity when compared to human language as the human brain can endlessly trigger new language structures and combinations when new contexts or experiences evolve. This human capacity, as explained above, springs from human *instinct*. That AI applications can simulate human intelligence but cannot simulate their instinct is made clear in Bergson's differentiation between intelligence and instinct.

Bergson's definition of intelligence and instinct exhibits that instinct is superior to intelligence which, ironically enough, indicates why human artists surpass AI authors. Bergson (1922) compares

intelligence and instinct by observing that intelligence is an inborn faculty that focuses on forms where instinct focuses on content, a difference which makes their targets and achievements different (pp. 157 - 159). By the same token, AI may not be able to correctly process the available information – syntactic units or strings of words or phrases fed into the computerized language models – without the ability to infer the real meanings or semantic content because AI lacks instinct. In this regard, one can conclude that instinct relates to emotion, which is, as mentioned before, a human characteristic that cannot be replicated by a language model:

> Rhetorical or formal devices, like figurative language, imagery, alliteration, rhyme schemes, repetition, metre, do not have intrinsic aesthetic value but gain their effectiveness by the contribution they make to a desired end, be it emotional impact, realistic depiction, humour, or poetic insight. (Lamarque, 2008, pp.10-11)

The words *desired* and *emotional impact* call to mind Dewey's and Bergson's views on experience. Dewey (1917) writes: "There is, apparently, no conscious experience without inference" and "Where there is experience, there is a living being. Where there is life, there is a double connexion maintained with the environment" (p. 8). Dewey (1917) stresses that experience comprises two factors: undergoing and doing, the first of which is, definitely, absent in AI.

In AI applications, experience is based on algorithms where a prompt requires from the language model to produce language structures that fit in with certain situations. The situation is described by the human author and the information is fed into the application to prompt it to write the scene. The scenes in *Permeation* were, similarly, written by using prompts with GPT2. The AI produced structures are, afterwords, edited by a human author as the *Permeation* team have done. In this way, human experience is the data which the AI application manipulates.

Clearly, Dewey relates human experience to inference and to the power of making a choice, qualities that are exclusively human. Dewey (1917) stresses: "Experience, in other words, is a matter of *simultaneous* doings and sufferings.… we must choose". (p.11) The analogy between Dewey's and Bergson's views is clarified in their common concern with exclusive human traits like *inference* and *intuition*, both of which are parts of the human experience of *reality,* a problematic term that is far from being relevant to AI. In *Creative*

Intelligence, Dewey (1917) directly refers to Bergson's concern about intuition and how it relates to the mind and to reality (p.54). In *Laughter*, Bergson (1928) elaborates on the concept of individualised experience in similar terms describing art as "certainly only a more direct vision of reality" (p. 157). On the art of drama Bergson (1928) writes: "So it is indeed a deeper reality that drama draws up from beneath our superficial and utilitarian attainments" (p. 160). Bergson (1928) reaches the conclusion that art always "aims at what is individual" (p. 161).

It is worth noting that Bergson's vision of aesthetics and views on art are not expressed in a single work but spread over the bulk of his work. Sinclair (2020) summarises Bergson's aesthetic theory by interpolating direct citations from Bergson's *Laughter* into his own explanatory text. Sinclair (2020) quotes Bergson's meditations on the artist's mission which aids the audience to explore the reality of the outer physical world as well as the individual's inner world of feelings, both of which are given expression in an artistic product with distinctive features. Here, it seems pertinent to provide a direct quotation from Bergson (1928) where he seems to reiterate Dewey's view of art as the outcome of the experience of the individual with his surroundings:

> What is the object of art? Could reality come into direct contact with sense and consciousness, could we enter into immediate communion with things and with ourselves, probably art would be useless, or rather we should all be artists (p.150).

The focus on the role of emotion in artistic creation referred to by Dewey is also echoed by Bergson (1928) who notes that

> When we feel love or hatred, when we are gay or sad, is it really the feeling itself that reaches our consciousness with those innumerable fleeting shades of meaning and deep resounding echoes that make it something altogether our own? We should all, were it so, be novelists or poets or musicians. (p. 153)

From the discussion of Dewey's and Bergson's views on aesthetics and literary creation, one can adopt their arguments in favour of human creativity in a manner that renders literary creativity by means of AI much inferior to human accomplishments in the field. In AI, specifically in language models like GPT2, the absence of will, choice, instinct, sensory experience and emotion results in major challenges that are yet difficult to overcome. The absence of

imagination, inference and intuition is also evidence of the limited potentialities of AI. The following section will attempt to prove the validity of the argument by analysing the form and content of *Permeation* and listing the shortcomings from the perspective of the human participants in the project THEaiTRE, the name of which, intelligently enough, comprises of the word "theatre" and the abbreviation "AI" joined in an eye-catching alternation of capital and small letters and calligraphic contrast.

Permeation:

Permeation (2022) is a drama generated by a version of Generative Pretrained Transformer (GPT-2) in the Czech Republic as part of the THEaiTRE Project that was co-financed with the state support of Technological Agency of the Czech. The project was undertaken by a group of researchers at Charles University, Faculty of Mathematics and Physics, Institute of Formal and Applied Linguistics, the Švanda Theatre in Smíchov, Theatre Faculty and the Academy of Performing Arts in Prague to use Artificial Intelligence in generating dramatic texts. The script was generated in English then translated into Czech. The play premiered on 12th June 2022 in New York City as the second product within the project. It was preceded by a computer-generated script, a play explicitly entitled *AI: When a Robot Writes a Play*, that appeared online on February 26, 2021. The production of *AI: When a Robot Writes a Play* marked the centenary celebration of the first appearance of the word *robot* in the theatre play *R.U.R.* or *Rossum's Universal Robots* which premiered in 1921 as the joint product of the Czechoslovak brothers Karel and Josef Čapek. Detailed information on the process of creating the two scripts is given in *THEaiTRE: Generating Theatre Play Scripts using Artificial Intelligence* (2022), a book compiled of chapters written by the different members of the research group and edited by J. Hajič, Czech computational linguist and the former director of the Institute of Formal and Applied Linguistics at the Charles University in Prague. The analogy between *R.U.R.* or *Rossum's Universal Robots* (1921) and *AI: When a Robot Writes a Play* (2021) was related to the reference to the robot in both. Although *R.U.R* has remained an outstanding drama for a century, *AI: When a Robot Writes a Play* (2020) does not seem to have received positive reviews. A couple of

reviews on the play may explain why the project team decided to make another attempt by producing the second play, *Permeation*.

In a review on *AI: When a Robot Writes a Play*, S. Both (2021) asserts that "A robot cannot write a play …. a play is more than just a string of dialogue". In her review of the same play, Arifa Akbar (2021) argues that "a robot cannot write an original or engaging play, at least not yet" because "Questions on life, companionship and mortality are voiced but they seem like emotionless musings with no sense of drama, depth or story". Akbar's focus on the emotional aspect of human experience proves the relevance of Bergson's and Dewey's writings on literary creation and the pertinence of their aesthetic theories when applied to the products generated by AI in an attempt to replicate a human-generated dramatic text. F. Morgan (2021) refers to the admission voiced by David Košťák, the project dramaturge who revised the script, concerning the robot's inability to understand emotion. This may explain why the project members embarked on the creation of *Permeation*, their second play generated by GPT 2, hoping that the challenges and shortcomings encountered in the creation of the first play could be overcome.

Rudolf Rosa, the project leader and an expert on computational linguistics and natural language processing explains that the second play, *Permeation*, relied on a prompt to introduce the basic elements in the play, mainly the locale and the opening lines. Rudolf Rosa does not deny that the text of *Permeation* includes a main flaw which is the absence of a clear sequence of events due to the generator's limited potentialities (Hajič, 2022, pp. 19-20). This means that human intervention was necessary. Rudolf Rosa also states that a shortened version of *Permeation* in Czech premiered on 17th June 2022 at Švanda theatre where the parts that did not make sense in the previous long version were removed to overcome the failings in the structure of the dialogue created by the generator (Hajič, 2022, p. 22). Concerning the incoherence of literary texts generated by AI, Khalili (2021a) observes that the failings in form and content indicate that the machine author cannot be solely relied on and that a human agent should interfere to guide and correct the parts written by AI. In addition to incoherence, the analysis of the play under study will show that there are further problems that add to the challenges encountered on the use of AI in literary creation.

Chapter three of *THEaiTRE: Generating Theatre Play Scripts using Artificial Intelligence* (2022) includes a detailed discussion of *Permeation* by Rudolf Rosa, whose expertise as the project leader and an expert on computational linguistics and natural language Processing lends reliability to his views. A reading of the script proves that Rudolf Rosa's testimony that the audience found it "unclear what the actual plot was" is not groundless (Hajič, 2022, p. 22). The play consists of ten scenes where the married couple, Nina and Ivan, pose as the main characters; however, their relationship is hard to describe, for in some scenes they demonstrate affection while in other scenes they seem skeptical about constancy or fidelity. The reader, however, does not find details about their life, motives or aims in any part of the text, not even in the stage directions. The dialogue, incoherent and fragmentary, does not give adequate information about what is going on or heighten a certain feeling. It only refers to war and an assassination plot without revealing the causes for action. Some parts of the dialogue are mere expressions of fear or rather panic of war or death but no psychological depth is provided in character portrayal to justify why such emotions are expressed. An extract from the introductory scene proves the point:

Ivan: We're going to be safe. We're going to
be together.
Nina: Oh God...
Ivan: It's okay.
Nina: It's not okay.
Ivan: I love you.
Nina: Ivan, I'm so sorry.
Ivan: It's okay. It's all right. We'll be together.
We'll be fine.
Nina: We won't be okay.
Ivan: I love you. (*Permeation*, 2022, Scene 1)

A quotation from scene two, where a Ferryman appears to save Nina from an unknown danger, shows that the text is, as Rudolf Rosa puts it, "partially unintelligible" (Hajič, 2022, p. 20). The scene reads:

Ferryman: Get in.
Nina: Who are you?
F-man: My name's Stravanavitch. . . I'm a ferry
master and this here's my boat. . . You'll
find it very quiet here. The river isn't

> too bad, it's pretty shallow, we don't
> see many people on our boats, but we
> have an amazing crew - most of us
> work with children - some old, some
> young - I'll tell ya about them - but
> that's no matter now. (*Permeation*, 2022, Scene 2)

The fragmentary dialogue could have been understood, however, if a valid dramatic situation is created in *Permeation*. It seems that the prompts used by the human author to help GPT 2 create the scenes have missed the target. In the above scenes, the absence of causality is behind making the dialogue insipid, for there is no reason for the accelerated tension demonstrated in the scenes. The rising of conflict, which is the backbone of drama, is not governed by a causality structure. It is sudden and forced on the scenes. Rudolf Rosa explains that the human collaborators, bearing in mind that "the dramatic situation is considered to be the building block of drama", decided to work on "devising a list of dramatic situations" to serve as a "corpus" or a "repertory of situations" for their project (Hajič, 2022, p. 24). However, the problem seems to be the inability of the GPT 2 author to choose from the given repertory a coherent plotline with related dramatic situations or episodes. In other words, the lack of a suitable dramatic situation to heighten the tension in *Permeation* is not due to the scarcity of situations, for the human collaborators could annotate a number of situations from popular works by humans to be manipulated by the machine author. The problem seems to have stemmed from GPT 2's compilation of unrelated parts of dialogue to initiate action. This may explain why the dialogue is uninformative and inexpressive of logical progress in the play. Ironically enough, "recognizing a dramatic situation is difficult even for humans, as the annotators often could not agree with each other and their readings differed" (Hajič, 2022, p. 28). What is even more disappointing is that the project team "are limited by copyright …[as] the copyright holders, trying to gain the rights to publish the annotated plays" (Hajič, 2022, p. 28). The same concern about the rights of intellectual property is voiced by Khalili (2021b):

> perhaps artificial intelligence models will replace the human author outright. But AI showed there is no reason a healthy symbiosis cannot exist between the two. The main question left to iron out in this scenario will be: who ends up with the credit?

Chapter five of *THEaiTRE: Generating Theatre Play Scripts using Artificial Intelligence* (2022) sheds light on another obstacle that the machine author could not handle when writing *Permeation*. This is because a play mainly relies on non-verbal elements that are accessible to man through human recognition while "the robot lacks any idea of the characters' non-verbal actions and of a coherent fictional world" (Hajič, 2022, pp. 31-33). The robot simply has no imagination or any experience that pertains to sensory perception. This brings to mind the concern of both Bergson and Dewey about the significant role of imagination and sensory perception in artistic creation (Bergson, 1922, p. 95; Dewey,1980, p.103). The role of the human author, thus, cannot be limited to feeding the language model with linguistic input or giving prompts. Human intervention is necessary because the non-verbal elements in a play are beyond the potentialities of the AI language model. An extract from the closing scene of *Permeation* proves the point:

Rusik: Do you see that gun, Nina? Ivan is
planning an assassination.
Nina: I don't understand! Who does this
have in mind?
Ivan: He knows
…………………..
Nina: You're breaking the promise. Please.
Please don't do this!
Rusik: Don't do this Ivan!
Ivan: Goodbye. We will meet each other
soon.
/Ivan tooks (sic) his weapon and leaves. /
The end (*Permeation*, 2022, Scene 10)

The scene boils down to stage directions that are closer to narration rather than description and the play ends with the plot left obscure. The audience do not get a clear idea about the resolution of the play as Ivan takes the weapon and leaves depending on the fact that Rusik *knows* the details of the assassination that is supposed to take place. Ironically enough, the dialogue does not provide the minimum of the required information for Nina or the audience; Ivan simply announces that "He knows", referring, most probably, to Rusik. The abrupt ending of the play, it should be noted, cannot be deemed an open

ending but can only be considered a marked disregard of the law of causality.

Permeation, obviously, starts and ends with no real action. Real action does not take place nor is it reported in the dialogue. The events that seem to progress in the ten scenes that the play comprises of do not adhere to any kind of clear structure, linear, cyclical or episodic. In this respect, the action meant is not only physical action but relates to the development of the portrayed characters. The characters just physically move from one indefinite place to another and the reasons for such moves are always vague. An illuminating remark on literary creation is offered by David Košťák: "In robotic texts, this intention is missing… while an author of flesh and bones writes because of a certain own need (which is not merely existential), the robot writes because it is required to do so" (Hajič, 2022, p. 33). Košťák's words seem to echo the views of Dewey and Bergson discussed above concerning intentionality. The word *intention,* a human trait, is the clue to understanding creativity. Undergoing both experiences, the experience of a human author writing dramas and that of being a member and collaborator in the project to generate dramas by means of AI, David Košťák reaches the conclusion that:

> The input data, entered by the live co-author to breathe in inspiration, must also be adapted to this. The starting lines are clearly confrontational in order to define the relationship of the two characters. The input should already deviate from the realistic perception of the world so that the text is consistent. The generated dialogues have not been able to satisfy the psychological demands. (Hajič, 2022, p. 34)

The reference to the psychological demands of the human author and reader underlines the importance of artistic appreciation as one dimension in literary creation. In aesthetics, the creation and appreciation of art are two sides of the same coin. Human capacities like volition, intentionality, imagination, and intuition distinguish human authors as well as audiences while their absence marks the limited potentials of AI in literary creation.

Conclusion:

The examination of *Permeation* clearly demonstrates that the prominent feature of the text is the incoherence of form and content.

The play is made up of ten scenes that do not exhibit a clear plotline or a pattern of related episodes. The absence of dramatic structure, is a basic weakness in the play. The dialogue is fragmentary and uninformative and the characters do not exhibit psychological depth. The major failing in the text is the absence of an enhanced dramatic conflict that underlines an emotional experience or reveals character traits. The initial scenes do not lead to real progress in the play and the ending is forced, vague and not governed by causality. It seems that the 10% of human contribution to the writing of the play has not prevented the shortcomings mentioned. This explains why a re-examination of the aesthetics of human literary creation was pertinent to the discussion of the challenges and opportunities of using AI in the field of literary creation. In an attempt to foresee the future implications of using AI in literary creation in the light of Dewey's and Bergson's aesthetic theories, one concludes that both Dewey and Bergson emphasize the importance of individualized human experience as a source of inspiration. Experience, they believe, entails the contact between a human being and the surrounding environment whether natural or cultural. For them, creation hinges on the manipulation of sensory perception, instinct as well as intuition, three human faculties that are inaccessible to AI. Imagination too is a human faculty that is and most probably will always remain totally absent in AI applications. Closely related to the mentioned qualities is human volition, the human characteristic that spurs a human being to make choices. The ability to make choices, in turn, relates to emotion, a human quality that is not available in the most advanced technology. The absence of these exclusively human abilities or, if one may call them, gifts, in AI applications may explain why AI generated dramas, such as *Permeation*, belie the machine's ability to replicate human creativity. Opportunities for a collaboration between man and the machine may prove feasible in the future but not before questions of bias, liability, rights of intellectual property, and cultural repercussions are taken into consideration. Concerns about indoctrination and propagandist aims should be addressed as well. One finds an apt conclusion in Khalili's remark (2021a): "The possibilities are as captivating as the dangers are terrifying."

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