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Children, time, and the sublime.
New perspectives in educational aesthetics

Abstract
Is it possible that children experience something we could judge as the sublime? Some pivotal conjectures have been elicited to positively answer these questions; however, this general topic still stands in need of fuller theoretical and empirical insights. Since taking up this challenge may have important implications in the ever-expanding field of aesthetic education, in this article I will give a philosophical account of the experience of the sublime in 8-10 children, identifying both its plausible components and its markers, which opens up future empirical inquiries.

Keywords
Sublime, *Time perception*, *Children*, *Educational aesthetics*

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1. *Introduction*

When I was a child, approximately eight years old, I happened to be fascinated by a huge chemical factory located 15 minutes by car from my parents' place. We use to drive by it almost every day, since it was close to the entrance of the main highway connecting my village to the city. Sometimes, when coming back home late in the dark, I could not take my eyes off this giant illuminated building I could see through my parents' car windows. Its picture is crystal clear in my memory even now, and I can easily remember the feeling of being attracted and, at the same time, terrified by the mystery of this factory and its big red sign on the top, silhouetted on the fore of the black sky. I did not know, at that time, that my experience might probably have been labeled as an experience of the sublime.

Thinking about the sublime now, the clearness of the feeling I had as a child slightly turns into the opacity of philosophies struggling with this puzzling aesthetic experience. As Sandra Shapshay says, quoting The New Yorker art critic Peter Schjeldahl (2001), the sublime is a "hopelessly jumbled philosophical notion that has had more than 2 centuries to start meaning something cogent and hasn't succeeded yet" (Shapshay 2021: 123). The wide range of phenomena that fall under the category of the sublime-elicitors (landscapes, artworks, poems, overviews, natural catastrophes, ruins, music, to give some examples) reflect the philosophical indeterminacy of this concept[1]. Along the modern age, the sublime recursively occurred in Boileau (who translated Pseudo Longinus *On the sublime*), Baille, Burke, Kant, Du Bos, Schopenhauer, Hegel, Nietzsche, inspiring metaphysical, aesthetic, ethical reflections in different national contexts (Franzini 2015). In recent years, the sublime has reawakened considerable interest in analytic philosophy (see Budd 2003, Fischer 1998, Brady 2013, Shapshay 2021, among others) as well as in continental philosophy (Lyotard 1994, Derrida 1979, Nancy 1993, Lacoue-Labarthe 1993, Richir 2010) and, finally, in history of philosophy (Clewis 2019)[2]. In analytic philosophy this interest has got in part motivated by the analogous

[1] Not all philosophers agree on listing all these phenomena under the category of the sublime. For an accurate review of the philosophical theories of the sublime, see Mazzocut-Mis 2005.

[2] For reflection on the sublime with a specific reference to visual art, literature and cinema, see Bessière 2007, Most 2012.

enthusiasm of the psychology-based research on awe, an emotion characterized by the same core components of the philosophical sublime (Arcangeli, Dokic, Sperduti 2018).

Even though some recurrent features of the sublime can be isolated in the existing body of studies, an accurate portrait of it is still lacking in philosophy. It would be an attractive shortcut to account for this lack by referring to the a priori nature of the sublime, i.e., to the fact that the sublime has been, by definition, thought as a sort of emotion of the infinity falling beyond human understanding. However, we must admit that, even if we cannot metaphysically explain the magnitude we perceive when looking at natural phenomena or art in itself, we can nevertheless phenomenologically shed light on our experience of the sublime. Drawing on this assumption, my contribution aims to elucidate the debated status of the sublime as an aesthetic experience, and furthermore to argue for its possibility in children. Specifically, my aim in this article is to give a philosophical account of the experience of the sublime in children, identifying both its plausible components, and its markers, which opens up future empirical inquiries. I will suggest that a good empirical marker of the sublime experience in children might be the alteration in inner retrospective time perception. This suggestion is supported by a wide body of research on how emotion affect inner feeling of time passing, both from a phenomenological (Husserl 1969; Heidegger 2010; Ricœur 1981; Sartre 2001) and from a psychological perspective (Gil and Droit-Volet 2009; Gable *et al*. 2016; Benau, Atchley 2020; Yin *et al*. 2021). Furthermore, my hypothesis intends to improve some empirical research that have already been done on the influence of awe on time perception (Van Elk 2020) in adults, and to further extend them in children.

My purpose is motivated not only by a purely theoretical, self-driven and disinterested, curiosity, and by the desire of retrospectively rationalizing the meaning of my enigmatic pleasure when, as a child, I was amazed by the huge building in the night. It is also motivated by the possibility that experiences associated to the sublime (for instance, being immersed in the nature or in overwhelming virtual realities, attending highly emotional theatrical or music performances, dealing with great artworks and historical artifacts) might improve children learning processes, since these experiences have been found having positive outcomes in adults, such as enhancing pro-social behavior, well-being, curiosity (Chirico, Yaden 2018), and triggering ideas of universality, connection and altruistic feelings. Furthermore, it has been argued that awe also makes people feel as they are rich in time (Rudd 2012). Finally, taking up this challenge

may have important implications in the ever-growing interest in aesthetic education, once it will be proven possible not only that children can feel the sublime, but also that this experience may be a key driver in education[3]. The latter hypothesis is motivated by the characteristic of awe of involving the need for cognitive accommodation (Kaltner, Haidt 2003; Campos *et al.* 2013), which is a crucial element of early learning.

In short, through a definition of the sublime in adults based on philosophical and psychological literature, I will claim that the sublime is an emotional construct which essentially influences internal time perception in adults. Drawing on developmental psychology literature, I will then analyze if children's cognitive capacities positively match abilities needed both to experience the sublime and to internal estimate time. In conclusion, I briefly indicate some methodology to empirically analyze time perception in function of the sublime experience in children, and articulate some predictions on how this experience might bias children toward a longer or shorter internal time estimation.

2. *The sublime in adults*

Before approaching the model of the sublime in children I propose here, it is helpful to examine the descriptions that have already been suggested in the philosophical literature to find a minimal definition of this experience in adults.

I will not refer to the "rhetorical sublime", i.e., the sublime that is attributed to particularly touching and high-literature poems that are able to morally elevate our soul. Neither will I refer to the moral component of this kind of sublime (Franzini 2015: 46). Since my purpose is to explore the possibility of the sublime as an aesthetic experience in children, I will refer to the philosophical tradition that, starting from the rhetorical tradition, sees the sublime as an aesthetic experience, more precisely the one we have when dealing with astonishing, wonderful artworks (Pyramids, ancient ruins) or natural phenomena (starry sky, waterfalls, the Alps…). I surmise that this kind of experience is intuitively more suitable for children rather than reading classic poems, which need sophisticated hermeneutic skills to elevate our moral consciousness.

[3] For a first step in this direction, see Prade 2022.

One of the first modern philosophical source on the sublime is Baille (1996: 87-100). According to him, the sublime is, on the one hand, something perfect because it respects formal principles of classical harmony and beauty; on the other, it always involves a sort of "non-familiarity". The author sees a similarity with the pathetic, but stresses that, contrary to the latter, the sublime flows into its resolution and its outcome is a positive and quiet feeling. Harmony and non-familiarity recur in a more accentuated form in Burke, who provided modern philosophy with one of the most famous definition of the sublime: a "sort of delightful horror" bringing a "solemn calm" (Burke 2001: Note 1, Part IV, sect. 12; Note 2, Part IV, sect. 14). Burke's description of the sublime inspired following readers, such as Kant, who defines the term sublime as "the name given to what is absolutely great" (Kant 2007: 78), and specifically to something

> The mind is not simply attracted by […], but is also alternately repelled thereby, the delight in the sublime does not so much involve positive pleasure as admiration or respect, i.e. merits the name of a negative pleasure" (Kant 2007: 76). […] provided our own position is secure, their aspect is all the more attractive for its fearfulness; and we readily call these objects sublime, because they raise the forces of the soul above the height of vulgar commonplace and discover within us a power of resistance of quite another kind, which gives us courage to be able to measure ourselves against the seeming omnipotence of nature. (Kant 2007: 91)

Building on modern definitions, contemporary philosophers described the sublime, again, as a "terrible beauty" (Brady 2013: 186) or as a "self-negation due to a sense of overwhelming impact or more reflective consideration of one's vanishingly tiny substance in comparison to the object" (Cochrane 2012: 132). Beside this puzzling panorama of perspectives, analytic philosophy provides the research on that topic with a minimal linear profile of this experience. In brief, the common pattern which is possible to identify on these sources is that the core aspect of the sublime is its ambivalence (i.e., it involves both negative and positive feelings boiling under our spontaneous aesthetic judgements), and that the negative part of the sublime refers to the sense of being humbler, smaller or diminished triggered by objects appearing extremely vast in size or might (Arcangeli 2020).

The positive part making overall the sublime a pleasant emotion we want to reproduce has been explained in different ways. For some authors, the sublime is a temporally extended process (Shapshay 2021; Dokic 2016: 70) in which a sense of being overwhelmed is followed by a

sense of coping with this feeling. According to Sandra Shapshay, the feeling of being smaller ("thin sublime") is a simple affective sub-personal state, not involving a reflective process. The "thick sublime" comes after that, as the result of a cognitive process involving ideas through which one can interpret the awe response to the vast phenomenon, and thus accommodate to the thin sublime by articulating its meaning. For example, one can interpret awe experience as a religious experience, as an episode of being in unity with the world, or, as Kant did, as an evidence of human moral vocation (Shapshay 2021: 132-133). This model lies on the assumption that the sublime involves as an ingredient the emotion that psychologists call "awe", i.e., the construct developed as a response to something extremely vast and powerful that makes the self and one's personal understanding of the world shaken (Keltner, Haidt 2003; Prade 2022; Saroglou *et al.* 2008; Bussing *et al*. 2021; Stancato, Keltner 2021). During awe, personal prior knowledge, beliefs, and mental schemas become unstable and must be reconstructed to fit the awe-triggering phenomenon (Prade 2022). In the case of the sublime, this accommodation would correspond to the evaluation of the aesthetic importance of the awe-triggering object (Arcangeli *et al*. 2020).

Conversely, in the "identification model" proposed by Cochrane, the pleasure involved in the sublime is not the result of the process of interpretation, but it is, instead, involved in the feeling of fear itself. To this view, during the sublime, one does not feel released because they have been able to pass through darkness and eventually to reach the light. One rather enjoys the intense moment of displeasure itself, and this tension is what characteristically concerns the sublime. According to Cochrane, this is because when experiencing something much bigger than us – a landscape, the overview of a mountain or of the earth –, we immediately feel smaller and vulnerable, but at the same time the power of this emotion is enhanced by the imagination of the subject involved, who feel themselves as strong as the sublime object (Cochrane 2012: 132). In contrast to the relief-based emotional narrative (the pleasure comes when the fear is over, and because the fear is over), the account proposed by Cochrane suggests that we emphatically identify with the magnitude of the sublime object, we feel the vastness of the phenomenon as a sort of vastness of our body, and this is what delights instead of terrifying us (Cochrane 2012: 145).

I resist the identification model since to me some objections might be proposed specifically to the fact that it cannot accurately fit some experiences related to the sublime, as the experience of minuscule objects or

beings (for instance, organisms that can be seen from the microscope only). This kind of minuscule phenomena can trigger the sense of being humble through an act of imagination, since they evoke that there are entire universes existing beyond our ordinary experience. We can represent them and visualize their vastness and, at the same time, feel smaller without any empathy projecting that vastness in our body. More in general, as Cochrane recognizes himself this model does not fully match the experience of the sublime elicited by abstract and not merely physical greatness (Cochrane 2012: 143). I will thus refer to the "interpretation model", based on psychological research on awe, to develop my argument.

Since I base my conjectures on the assumption that awe and the sublime are in some manner related, before moving on a direct focus also on the distinction between the two is needed. The specific difference between the sublime and the awe is that the sublime is an aesthetic experience. As I claimed above, indeed, in the experience of the sublime we interpret awe-triggering phenomenon as aesthetically important. One may put forward, however, that the definition of what an aesthetic experience is, is not yet uncontroversial. Indeed, as in the case of the sublime, if we look for only undisputed features of what we refer to as an aesthetic experience, we gain a meager loot. The minimal phenomenological description of what we would accept to call aesthetics is a self-sustaining attentional experience involving a specific degree of pleasure (Schaeffer 2015b: 146). It is thus an experience we seek for and want to reproduce even if it does not involve any external reward expectation. It is nevertheless controversial if aesthetic experience is perceptual (i.e., if it involves some either mind-dependent or independent aesthetic property or value as intentional perceived contents); if these contents relate to formal or actual objects (Dokic 2016: 72); or if aesthetic experience is not intentional at all. Dokic (2016: 74) indeed suggests that aesthetic experience is an overall pleasant, non-intentional second order process of organizing non-aesthetic various attitudes as, among others, perceptions, and feelings. On this view, aesthetic judgements reflect subject's sensitivity to the phenomenological profile specific of the cognitive processes underlying the aesthetic experience. This profile is characterized by both fluency and disfluency of sub-personal cognitive processes, since to be self-sustaining, as aesthetic experiences are, an experience must be neither only pleasing nor only interesting, otherwise it could end up being boring, for instance, or annoying, and thus motivating us to stop attending to it: it hence has to be both. According to this "dual-aspect view" (Dokic 2016:

78), it does so by reflecting antagonist epistemic feelings boiling under the phenomenological experience of the aesthetic object, and specifically processing easiness (fluency) and novelty, non-familiarity, difficulty (disfluency) of these non-aesthetic attitudes. To me, the dual-aspect view appears particularly convincing in elucidating both the inner motivation and the ambivalence of the sublime experience, and I will thus stick to it to further develop my arguments. Based on it, we gain for the sublime the additional characteristic of being metacognitive, given that metacognition is the ability to evaluate the quality of one's own internal states, and to regulate subsequent cognitive activities and behavior (Proust 2019: 60).

Summing up, the sublime in adults is a pleasant self-sustaining and thus approach-motivating aesthetic experience driven by vast and unfamiliar phenomena, involving a disorienting feeling of being smaller, undermining mental schemas and resulting in a metacognitive process of accommodation.

3. *The sublime and time perception*

As I have shown, lessons from psychological studies of awe have been taken to deepen the philosophical understanding of the sublime. I suggest that it would be particularly interesting for studies on the sublime to focus on psychological research deepening the relation between awe and time perception (Van Elk 2020). The relation between the sublime and inner time experience has been indeed already explored also by philosophers in many ways. Based on these sources, I will surmise that the way the sublime might affect time perception could be an important parameter to empirically identify this experience in adults as well as in children.

A few accounts on how the sublime affects time have been given by Kant's readers. Drawing on the Kantian idea that, in the sublime, the failure of the imagination in representing the sublime object and the power of reason in judging the infinity of the phenomena are there literally at the same time, Lyotard argued that the sublime can be characterized as an event. The term "event" refers here to the paradoxical discontinuity-continuity of time experience in the sublime, or, in other words, to the tension involved in the sublime between the fluidity of the ongoing time experience and the unexpected phenomenon grasping us through its vastness. This "event" can be read as a rupture in ordinary temporality

since it cannot meaningfully fall in the ever-unfolding subjective experience. To put it differently, the sublime is not prepared by emotions, feelings, perceptions occurring right before it, neither it immediately deflates in the calm of the adjusted feelings which come right after it.

Another path can be also taken to approach the relation between the sublime and time estimation to better understand our experience of the sublime instead of the sublime in its own sake. This path grounds in the assumption that emotion has been long identified as affecting time perception. From a phenomenological analysis, emotions are an attitude which primordially affects our being-in-the-world. Following and at the same time criticizing Heidegger's arguments in *Being and Time* (Heidegger 2010: 35-6) Jean-Paul Sartre addresses emotions as general attitudes overall affecting how human beings (or "Dasein", according to Heidegger's vocabulary) are in the world (Sartre 1939: 11). Since temporality has been described in phenomenology either as the condition of possibility of any experience (Husserl 1928), either as the primordial dimension of conscious beings (Heidegger 2008), either as the structure of life's experience (Ricœur 1981), emotion should in this framework straightforwardly be conceived as an essential aspect of conscious life unfolding over time and affecting time perception as part of the overall human experience it affects.

Switching from essential structures of human consciousness to facts, research in psychology has confirmed those arguments, and added new insights in the specific mechanisms involved in how emotion affects time perception. I surmise that the "motivation-based model" is particularly appropriate for emotion involved in aesthetic experiences since these are characterized by a strong motivation profile. On this account, motivations are defined as action tendencies, or the urge to approach or withdraw, inherent in affect. Based on that definition, some emotions are found being approach motivating, encouraging an organism to move towards a desired goal (Gable, Dreisbach 2021), and others are described as withdrawal motivating, encouraging an organism to move away from an adverse stimulus (Gable, Harmon-Jones 2013).

The motivation model elucidates how emotion affects time differently from valence-based and arousal-based models. The former refers to positive and negative valence stimuli: positive valence stimuli are judged for a shorter duration and negative valence stimuli are judged for a longer duration by the subject (Gable 2022). The arousal model is consistent with valence-based model and move further by adding that arousal intensifies the influence of valence in time perception. Both models have been

resisted by the alternative motivation model, which has brought to the fore how research has confounded arousal with motivation. For example, positive emotions and negative emotion (like anger) may be opposite in motivational direction. Furthermore, researchers have argued that negative affects can hasten the perception of time passing (Gil, Droit-Volet 2009; Gable *et al*. 2016; Benau, Atchley 2020; Yin *et al*. 2021). It is thus more plausible that emotion affects time perception by affecting motivation, and specifically that approach-motivating emotions (either negative or positive) hasten time perception, whereas withdrawal-motivating emotions drives overestimation of time passing (Gable 2022: 3).

Since the sublime experience is an approach-motivating emotional experience (according to the dual view I already mentioned), we should thus expect that it somehow affects subjective estimation of time passing. Alteration in time perception might be considered, according to this view, as a necessary and not sufficient condition for the sublime to be experienced. I will now try to argue that measurable biases in subjective time estimation could be functional parameters to enhance research on children experience of the sublime, providing operative insights to empirically identify it.

4. *Children and the sublime*

Let us now approach the core topic of my contribution, i.e., children and the sublime. Before going into the details of my hypothesis, I believe it is worth mentioning that Maurice Merleau-Ponty is one of the few philosophers – and the only phenomenologist – dealing with the challenge of giving an account of children development in imagination and more in general, in aesthetic capacities.

The lack of interest for children in philosophy as subjects of experience – and not only as subjects to whom pedagogical efforts are addressed – also concerns aesthetics, and, a fortiori, the aesthetic theories of the sublime. The reason of this disregard could largely be ascribed to the transcendental attitude of philosophical inquiries in epistemology and in aesthetics. According to this attitude, the development of faculties or the difference in capacities between children and adults is not relevant in addressing the transcendental, a-temporal structure of human experience. Merleau-Ponty deconstructs this assumption supporting the idea that "phenomenology is not the science of eternal truths. It is the science of omni-temporality: an exploration of the very essence of temporality that

makes no claims to overcome temporality" (Merleau-Ponty 2010: 319). Phenomenology takes its place in experience, and even if it seeks the structure of this experience, it does not do so as a "leap outside of time" or as a "definitive system" of truth, but rather as an "infinite meditation" keeping experience as its ground (Merleau-Ponty 2010: 319).

Facing on the other hand the resistances of psychology to phenomenology, the argument supporting Merleau-Ponty's phenomenological inquire in children learning processes is that phenomenology is not introspection, as, in his time, psychologists mostly believed (Merleau-Ponty 2001: 399; 408). Phenomenology seeks the fundamental meaning of the experience, and this is the feature characterizing it and distinguishing it from psychology, which is, on the contrary, a science of facts. The meaning of subjective experiences is accessible only through retrospective reflection, which can be described as "an effort to disengage sense from a lived experience. Even Husserl claims that there is more certitude in an external perception than in the internal perception of introspection. It is a question of explicating the origin of internal perception as well as external perception. Only the efforts of a phenomenological reflection can take up others and what I witness as the behavior of others" (Merleau-Ponty 2010: 325). I am confident that stressing that point can stimulate further reflection on the topic, once it will be shown that it is prima facie possible to develop a consistent philosophical reflection on aesthetic experience in children.

Despite the lack of phenomenological studies on children and aesthetics, the body of literature on aesthetic education is currently sound (Contini, Manera 2019). In the first half of the last century, John Dewey (1934) already defended the importance of art in formal and informal learning, supporting his arguments in the framework of his pragmatic philosophy. Further, Nelson Goodman and the Harvard "Project Zero", a program of research in art education founded in 1967 and to which also Jerome Bruner contributed, relevantly improved the development of aesthetics education. H. Gardner and E. Winner further enhanced studies on children's abilities in perceiving aesthetic properties – for instance, beauty of drawings – from 6 years (Winner, Gardner 1983). My question refers to this framework in aiming to draw a philosophical model of children's experience of the sublime.

Based on the definition of the sublime I mentioned, it is not obvious to claim that children can have this experience as adults do. Some pivotal conjectures have already been made to address the core components of the sublime in children between 8 and 10 years old (Prade 2022), and this

is the age range I will refer to for reasons I will mention in a moment. Let us take the core features of the sublime in adults and see if they can a priori fit children's abilities:

1) It involves both negative and positive valence affective states.
2) It is triggered by objects appearing/perceived extremely vast in size and might.
3) It correlates with a sense of being smaller.
4) It involves conceptual capacities needed for metacognitively accommodate to the overwhelming phenomenon.

To which I claim we should add:

5) It affects time retrospective perception.

The three features I surmise as problematics are 2,3,4. 2 and 3 have been already discussed in psychology. The capacity of perceiving vastness is not given from birth (Prade 2022: 2), since 6 months old infants cannot label a stimulus as vast on an absolute scale, i.e., they can only perceive something as bigger than something else. Perceiving vastness and feeling smaller are indeed two sides of the same coin, and it is not possible to feel themselves smaller if the sense of the self has not yet been developed. Thus, children can experience awe only when they have gained a sound self-awareness and the ability of self-evaluation. This ability increases from 4 to 7 years; it is not the case for social comparison, though. Children up to 7 years old are not able to accurately estimate themselves, meaning they do not have the ability to compare themselves to the other and they end up overestimating themselves in a physiologically narcissistic way. In that phase of development, children are thus not yet good candidates for the sublime as well. They become more self-aware and able to simultaneously think about themselves and the other at the age of 8 and 10 years old (Prade 2022). At this point, it is a priori plausible that children might perceive this sort of vastness and, starting from 7 years old, it is also plausible that they can feel themselves self-diminished (Prade 2022). In late childhood and in early adolescence, they are even better in doing that, and the benefit of awe experiences in triggering knowledge exploration – and, thus, learning – would be extremely large.

Point 4 can been dismissed referring to research founding children are provided with complex metacognitive capacities which are crucial for them in learning (Proust 2019). Specifically, it has been shown that children from 4 years, exhibit verbal and non-verbal metacognitive behaviors and regulation of emotional and affective states (Whitebread *et al*. 2009). Furthermore, they can metacognitively process the effort to remember (O'Sullivan 1993), and the difference between difficult and easy item

pairs (Dufrense, Kobasigawa 1989). A further objection might be that children lack the cultural metacognitive tools needed for what Shapshay calls, as I mentioned, "thick sublime". I would reply that the cultural sources needed to reflect on the overwhelming experience of awe ("thin sublime") do not need to be sophisticated. Children just need "some sustained reflection on the challenge that the environment is presenting to the person's cognitive capacities" (Shapshay 2021: 129). I would expect the cultural resources needed to experience the natural sublime to be not extremely elaborated, or at least less elaborated than the cultural tools needed to interpret artworks. Children does not have to interpret their affective states by elaborated metaphysical explanation, but just making sense of them the best they can. It is thus not a priori an obstacle for children to experience the sublime, but it might be in case of significant cultural poverty.

On the present account, the sublime in children can be expected to have the same characteristic it has for adults, beside the fact that some of these characteristics can be partially strengthened or weakened depending, for example, on narcissism or available cultural sources.

5. *Time perception in children experience of the sublime*

These theoretical arguments have not yet been tested in practice, since it has not been proved in empirical psychology studies that the sense of awe develops alongside the sense of the self in development. Plausible options to mark it in children from 8 years old could include, as for adults, tracking facial expression, automatic nervous system responding, and non-verbal emotional vocalizations (Shiota *et al*. 2003; Campos *et al*. 2013; Cordaro *et al*. 2016). For the same reason I mentioned above when talking of the sublime in adults (i.e., the sublime is an approach-motivating experience), I suggest that manipulation on time perception on the function of aesthetic experiences associated with the sublime might also fill the gap between conjectures on awe in children and missing experimental data proving them in practice.

To support this suggestion, I first need to argue for children capacity to internally perceived distinct time durations. Most of the studies on children time estimation provide us with evidence showing that children from 7 years old can, even if less accurately than adults (Droit-Volet 2011: 10), match stimuli having similar duration, leading to the conclusion that children are able to perceive and judge time in its own sake and not only

on the function of the effort they put in given actions (Droit-Volet 2011: 3). In short, even if the ability to accurately estimate time duration inferentially is not developed, children at least from 6 years old must be able to judge time duration as they perceived it. However, this ability to estimate time accurately can be detected mostly in explicit processing of time, involved in turn in the processing of longer duration, in the judgment of new and unpredictable events, and in temporal tasks involving smaller numbers of trials (Droit-Volet 2011: 3), so those tasks during which the children can be focus on time passing only, drawing their attention almost exclusively on that.

Since children have an "internal clock" (Droit-Volet 2011: 3), I assume this latter might jam as in adults during the high emotional experience of the sublime, and I now consider how we can empirically verify this.

The main condition that experiments have to respect to reproduce the sublime experience is to provide an overwhelming phenomenon. To be overwhelming, a phenomenon or a situation need to be totally immersive – to drive the self-shaken and self-transcendent feeling I described – and surprising – to elicit the need for cognitive accommodation and knowledge reconstruction. This specific characteristic is lacking in the laboratory experiments so far conducted to measure awe impact on time perception in adults, and this probably explains why this research do not give a reliable account of the topic addressed, concluding with some doubtful remarks about the methodology they used (Van Elk 2020). In one of a few studies dedicated to awe influence time perception in adults, psychologists applied a tactile bisection task, in which participants categorized vibrotactile stimuli as being of short or long duration while watching awe-inspiring, neutral, and positive 30 seconds videos. In a further study the same psychologists also introduced a retrospective time estimation task. In both cases, they did not measure any correlation between awe experience and time perception (Van Elk 2020: 933). To me, it is legitimate to ascribe this lack of results to the protocol of the study. I highly doubt that a short video in may have the vastness, both in might and size, that is needed to – almost – literally take the participants' breathe away. Virtual reality could probably better respect this condition (Chirico 2018b). However, I would personally advocate for even more spontaneous experiences than these. It has been noticed that what concerns aesthetic experiences the most is that they can be elicited by the "honesty" and uniqueness of the "in flesh and blood" stimuli only, and not by a summary or a paraphrase of them (Schaeffer 2015: 163). The pleasure of reading a

poem or to attend a theater piece is essentially different from the curiosity that might arise from someone else's report of the experience they had of it. Drawing on that, I would suggest that this "flesh and blood" component is intuitively a key feature for the aesthetic object to elicit the sublime. Such uniqueness makes the sublime experience largely individual and likely to derive from unique contextual conditions that can hardly be reproduced in the lab. Based on that, to me, alteration in time perception can be more accurately detected from a phenomenological point of view from subjective reports of spontaneous experiences we could associated with the sublime. It would be possible to collect these reports through phenomenological interviews (Tarozzi, Mortari 2010) and questionnaires.

As far as time-measurement methodology is concerned, we may go for either the prospective or the retrospective method (Bisson, Tobin, Grondin 2012). Applying the former implies that people participating to the experiment are told that they will be asked to estimate the duration of a specific time interval. In the case of the retrospective method, subjective measurement of time, people do not expect that they will be asked to report the duration of an interval, thus measuring time in a purely retrospective way. In the first type of measure, attention plays a crucial role. In the second type, participants base their estimation on memory more than attention. In the few research studies available on children and teenagers experience of time in long duration task, almost only the prospective method has been used (Bisson, Tobin, Grondin 2012). However, the lack of attention on the time passing might be a benefit when children time estimation has to be measured, since children would be completely immersed in the context and their judgment on time will therefore be honesty effort-based, time perception being affected by the inner motivation of the contemplation. This consideration motivates the idea that retrospective interviews and questionnaire might be a better method to empirically recognize the sublime experience in children on the function of the alteration in time perception. Furthermore, the sublime experience is a self-transformative experience, thus it cannot in principle be predicted.

Even if there is no yet empirical backing for the idea that the sublime affects children time perception, based on the sublime and on the aesthetic experience model I referred to, I suggest we can make some predictions.

1) The dual-motivation profile of the sublime indicates as plausible that this aesthetic experience makes time seem faster. Since the

sublime is an overall approach-motivating experience involving positive and negative emotions, I suggest that the alteration in time perception introduced for approach-motivating emotions should apply to the sublime as well.

2) Since sublime-driven accommodations occur when the subject seeks the contemplation of the stimuli for their own sake beside any reward anticipation, this different kind of motivation might influence time differently from any other approach-motivating experience. It still remains unlikely that time perception is not affected, but it may be influenced in the opposite direction.
3) Since in the case of the mystic experiences subjective reports indicate that time seems to stand still (Van Elk 2019: 1), the perception of time passing faster might be more likely involved in more interactive rather than in entirely contemplative experience.
4) Since it involves a cognitive effort, the sublime experience might be estimated as longer in children, who tend to judge time in function of the effort of the work accomplished (Piaget 1946).

In any of these cases, an alteration in time perception would be a relevant empirical clue to identify the experience of the sublime in children.

6. *Concluding remarks*

Despite the growing interest in educational aesthetics of the last fifty years and more and despite arguments claiming that the sublime may have in children learning processes relevant beneficial outcomes, driving prior knowledge reorganization and thus new knowledge exploration, the question of whether children might have the aesthetic experience of the sublime stands in need of theoretical and empirical inquiries. As already remarked, my article intends to start filling this gap.

To do that, I provided a general definition of the sublime in adults based on modern and contemporary philosophical sources on this subject. I then suggested that the same model can be used in children, based a) on the analogy of the sublime in philosophy and the experience of awe studied in psychology b) on psychology pivotal research on awe in children. As a second step, I argued for children ability to have the experience of the sublime as a metacognitive aesthetic process involving positive and negative emotions. Then, I surmised that these arguments can be empirically tested by analyzing time perception in function of aesthetic experiences we could associate with sublime phenomena. I bring about this a)

by drawing on philosophical theories and empirical psychology research founding that approach-motivating emotion affects time perception b) based on the argument that the sublime can be put under the category of approach-motivating emotional experience. As a main conclusion, I argue that we can predict children time perception to be influenced in different ways by the sublime experience and I suggest some methodology (retrospective reports through phenomenological interviews and questionnaires) to verify this in practice.

It is fair to say that several questions falling beyond the scope of this contribution remain open and might be worth addressing in further interdisciplinary research. Just to mention a few of them, what specific positive outcomes the sublime experience have in children, and how the experience of the sublime might be used to enhance teaching activity of specific discipline such as, for instance, mathematics or natural sciences. I would intuitively claim that benefits in eliciting exploration at least of the specific sublime phenomenon experienced can be expected. Coming back to my memories, indeed, I cannot remember how fast or slow time seemed to have passed while as a child I was staring the sublime factory from my parents' car. I can state, however, that it was never enough to deplete my pleasure in deepening this overwhelming enigma.

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