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Rethinking surprise in music through Aristotle's *Poetics*

Abstract
The article revives the notions of thaumaston *and* thaumasion *from Aristotle's* Poetics *to study surprise in music perception. A detailed analysis of these terms reveals a previously unrecognised distinction between the potentially and the subjectively surprising, referring to the disposition to surprise and to its subjective experience, respectively. This distinction resolves important problems: if the experience of surprise is subjective, what does it mean when we attribute the quality of surprising to the musical event itself? And why does the same musical event elicit surprise in one listener while leaving another indifferent? The article furthermore studies the conditions of both types of surprising with particular attention to influencing factors such as expertise and purpose of listening. Thus, by analysing surprise in music, we discover a necessity and a way to bridge ancient and contemporary philosophy, reaching a deeper understanding of surprise and demonstrating how ancient concepts may enrich contemporary aesthetics.*

Keywords
Thaumaston, *Surprise*, *Music*

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Introduction

Surprise plays a crucial role in music aesthetics. According to Eduard Hanslick, "the most important factor in the mental process which accompanies the act of listening to music" is "the intellectual satisfaction which the listener derives from continually following and anticipating the composer's intentions – now, to see his expectations fulfilled, and now, to find himself agreeably mistaken" (Hanslick 1891: 135). Thus, surprise as an immediate reaction to a violation of an expectation, is a concept intrinsically connected to music experience.

However, what happens once a musical event elicits surprise potentially poses a conceptual problem. Once we experience surprise, we tend to characterise the corresponding event as surprising, thus attributing to it the quality of being surprising. This indicates a potential contradiction: on the one hand, surprise is a subjective experience, yet on the other hand, the qualification of the event as surprising implies the attribution of a property to the event in itself. It is important to understand what kind of property is under consideration here, namely, the ability, under specific circumstances, to elicit or trigger a specific response in an observer. Such a property can be thus defined as dispositional. This ambiguity in the meaning of the word *surprising* poses a challenge for the philosophical analysis of the concept of surprise and of its experience in music. In the current article, we resolve this tension by turning to Aristotle's approach to the notion of *thaumaston* (θαυμαστόν) in the *Poetics*.

Traditionally, the word *thaumaston* is understood as *wondrous* or *awesome*. This is entirely justified since the semantic weight of this notion resides in the concept of *thauma* (θαῦμα) strongly connected to the Ancient Greek discourse on wonder in relation to the origins and ends of philosophy. However, in the context of Aristotle's *Poetics* many translators interpret *thaumaston* through the concept of surprise. For example, in the translation prepared by Pierre Destrée and Ada Bronowski, *thaumaston* in 1452a4 corresponds to "surprise factor" (Destrée 2016: 241). David Konstan interprets *thaumaston* as "an element of surprise or wonder" (Konstan 2020: 64). This reflects the specificity of the meaning of this notion in the context of *Poetics* and of Aristotle's thought in general.

As remarked by Guido Cusinato, contrary to the Platonic approach in which philosophising does not necessarily imply the passage from *aporein* (ἀπορεῖν) to *euporein* (εὐπορεῖν) (Cusinato 2025: 118), in the Aristotelian framework this passage is taken as the end of philosophy (Cusinato 2025: 120). In other words, "the task of philosophical knowledge is to overcome

the ignorance of causes […] that have elicited wonder; but once those causes are identified, not only the condition of *aporein* is overcome, but also the very wonder itself" (Cusinato 2025: 120, my translation).

This indicates that Aristotle treats *thauma* as an epistemological tool for expanding knowledge and understanding: once faced with a situation that induced *thauma* one needs to find an explanation and turn to "condition contrary to the one in which we started our search" that is characterised as a "better condition" (*Metaphysics* 983a). Thus, in this context, *thauma* aroused before ignorance of causes has a slight negative connotation since Aristotle insists on overcoming this state favouring the opposite one.

Such an approach echoes today's view on surprise seen as a means for keeping our knowledge and our expectations coherent with what we perceive. One can grasp even a stronger connection between *thauma* and surprise from Aristotle's *Poetics*, where the meaning of *thaumaston*, inferred from the context of its first appearance in the text (1452a4), is explained through the contradiction with expectation, much as in the case of what we call *surprise* nowadays. Thus, within the domain of Aristotle's thought and, even more, in the context of *Poetics*, interpretation of *thaumaston* as *surprising* appears justified.

Let us remark that despite the contextual difference between *Metaphysics* and *Poetics* – notwithstanding the interpretation of *thauma* in *Metaphysics* as the epistemological impulse to philosophise while in *Poetics* it operates at an aesthetic level in strong connection with pleasure – the way Aristotle approaches this concept indicates a common underlying idea: in both cases *thauma* indicates the encounter with the unexpected that arouses eagerness for understanding. Nevertheless, the relation between *thauma* and surprise in the Aristotelian framework resides in a careful interpretation and adaptation of Ancient Greek concepts for the contemporary lexicon. While in the Aristotelian context surprise as we know it seems to participate in the experience of *thauma*, a broader philologically precise interpretation of this notion highlights significant difficulty in establishing a direct equivalence.

The reason for this is threefold. Firstly, one may distinguish various types of *thauma* as evidenced, for example, by Cusinato (2025) and Dubovec (2026). Secondly, "one of the chief difficulties in studying Greek concepts of wonder springs from the inherent slipperiness of the noun *thauma*, which can refer both to objects which cause wonder and astonishment (cf. the use of 'a wonder' or 'a marvel' in English), as well as to a

more general and often abstract feeling of wonder, surprise or astonishment" (Lightfoot 2021: 3). Thirdly, and most importantly, "in the Ancient Greek lexicon of surprise-terms […] there is no word there to mean surprise exactly as in modern English, or even έκπληξη as in modern Greek" (Kanellakis 2020: 5).

We will further discuss the Ancient Greek vocabulary for surprise-related concepts in the first section of the article where we analyse the existing approaches to surprise and identify conceptual puzzles. This section is followed by a thorough study of the passage 1452a1-10 (chapter IX) of Aristotle's *Poetics*. As a result, two aspects of surprising come to the foreground: the surprising-*thaumaston*, that refers to the disposition of an event to elicit surprise, and the surprising-*thaumasion*, that corresponds to a phenomenological experience of being surprised. As we argue, this distinction is crucial for reconciling the conceptual issues related to surprise and for clarifying the conditions of surprise experience. This is demonstrated through an applied study of surprise perception in music proposed in the third and the fourth sections that, focusing on the canonical Western-European instrumental classical music, propose respectively an overview of the specifics of musical surprise and a discussion of the conditions of the two types of surprising along with the factors that influence surprise experience in music.

1. *The concept of surprise*

In the book *Human emotions*, Carroll Izard states that "surprise or startle is activated by a sharp increase in neural stimulation" (Izard 1977: 277). By equaling surprise with startle and arguing that the main function of surprise is to "deal effectively with a new or sudden event and with the consequences of this event", Izard brings to the foreground the evolutionary aspect of surprise as a tool for survival and self-protection (Izard 1977: 281). At the same time, Izard also makes a reference to the works of William Charlesworth who defines surprise "specifically as a function of *mis*expected (as distinguished from *un*expected) events"[1] (Izard 1977: 283, Charlesworth 1969: 270). In this approach the events that deceive our expectations are clearly separated from those that occur suddenly without a link to expectation. This reflects the epistemic value of surprise

[1] Original typography.

as a means to assure coherence between our expectations and our perception.

We see two paths emerge: surprise in its purely evolutionary understanding of a startle reflex in response to a sudden intense stimulus and surprise seen as a reaction to the *misexpected*. The two approaches differ on the axiological level. Izard's surprise-startle highlights the value of surprise as a mechanism of self-protection, while the definition proposed by Charlesworth brings to the foreground the principal role of surprise as a tool for constant verification of our expectations. Therefore, surprise and startle should be clearly terminologically distinguished.

Interestingly, we find such a distinction in the Ancient Greek lexicon for surprise-related concepts and namely between *ekplexis* (ἔκπληξις) and *thauma*. According to Dimitrios Kanellakis, "ἔκπληξις […] was linked with 'the sudden'", while "an unexpected event or spectacle was characterised as θαῦμα (a wonder)" and could have been expressed otherwise as "something new or strange", "unthought-of" and "unhoped-for" (Kanellakis 2020: 5).

Contemporary research in the fields of philosophy of emotion and cognitive science interprets surprise in terms of a contradiction with expectations. In the sphere of aesthetics, Alexandre Declos defines surprise as "a cognitive emotion, consisting in the reaction to the violation of a genuine[2] or of an implicit belief or expectation"[3] (Declos 2014: 6).

An important element of this definition is the characterisation of surprise as cognitive emotion. Some scholars don't consider surprise an emotion at all, others include it in the list of basic emotions. It seems that the concept of cognitive emotion, proposed by Israel Scheffler, is a viable resolution of this debate. Scheffler explains that just as a moral emotion is conditioned by the presence of moral assumptions, cognitive emotion implies cognitive assumptions, those that are "relating to the content of the subject's cognitions (beliefs, predictions, expectations) and [...] bearing upon their epistemological status" (Scheffler 2009: 132-3). In these terms, on Scheffler's account, surprise is a specifically cognitive emotion "resting on the (epistemologically relevant) supposition that what has happened conflicts with prior expectation" (Scheffler 2009: 135). Thus,

[2] Following the reasoning of Declos (2014: 5), genuine expectations are to be understood here as explicit conscious expectations.

[3] Let us note that, even though in surprise theory the terms "expectation" and "belief" are often used as synonyms, Declos distinguishes between these concepts. Thanks to that, the fact is highlighted, emphasized by R. Casati and E. Pasquinelli (2007: 177), that expectations can be generated by beliefs.

surprise may be seen as an element bridging emotional and intellectual aspects of perception process.

Furthermore, the definition by Declos underlines that surprise is a reaction that is triggered by perception of a contradiction. This view is supported in cognitive science. *The encyclopedia of human behavior* (Reisenzein, Meyer, Niepel 2012) provides us with a more detailed description of this mechanism. In this source surprise is defined on the basis of schema theory, according to which, "human perception, thought and action are to a large extent controlled by complex, organized knowledge (or belief) structures, called schemas. Schemas can be regarded as informal, unarticulated theories, or as sets of beliefs, about objects, events, event sequences (including actions and their consequences), and situations" (Reisenzein, Meyer, Niepel 2012: 565). The main function of schemas is to guide the subject's actions following the interpretation of past and present experiences and to predict (as far as possible) the future events. We may observe that the correct execution of this function is conditioned by the conformity of the schemas to the perceptual data. Therefore, schemas must be constantly revised and adapted so that the prediction of future events is, with the highest probability, consistent with what will be perceived. In this context, the verification of the reliability of schemas is carried out, at least in large part, through the mechanism of surprise, which is conceived as the signal corresponding to the immediate output of the detection of a discrepancy of the activated schema (Reisenzein, Meyer, Niepel 2012: 568).

As the authors remark, "the assumption that surprise is caused by the detection of schema-discrepancies is an explication of the common-sense psychological assumption […] that surprise is elicited by […] events that disconfirm, contradict, or violate an expectation" (Reisenzein, Meyer, Niepel 2012: 566). It is highlighted that in the framework the words "expectation" and "belief" are used as synonyms. As the source argues, "this assumption is necessary to take account of the fact that surprise can also be caused by disconfirmation of beliefs about the past (e.g. one is surprised that the train departed an hour ago) and about atemporal states of affairs (e.g. one is surprised that a particular theorem follows from the axioms of a theory)" (Reisenzein, Meyer, Niepel 2012: 566). On the one hand, this approach overshadows the fact that beliefs may generate expectations, but on the other hand, it accounts for the belief as a superposition of expectations or as set of anticipations with their relevant possibilities. This point is particularly important for our future consideration.

Concluding, we may say that surprise is a cognitive emotion that is elicited in case of perceived discrepancy with beliefs or currently activated schemas. Since the expectations (or beliefs) and perceptual processing, and hence surprise, depend on the agent's individual cognitive abilities and knowledge, identical data may elicit surprise in some subjects when leaving others indifferent. This underlines the nature of surprise as a subjective experience. However, when an event occurs that elicits surprise, we tend to characterise it as *surprising*. Thus, a potential contradiction arises: attributing the quality of surprising may be interpreted as an attribution of a property, yet whether surprise actually occurs as a response to the surprising event differs across agents. This problem brings to the foreground the need to distinguish two concepts: surprise as a subjective experience and the surprising as the characteristic of the event that elicited this experience. However, the word *surprising* reveals a certain ambiguity since it may refer to phenomenological constatation of a surprise experience taking place as well as to a characteristic of an event as contradictory to the activated schemas.

An analysis of Aristotle's approach to *thaumaston* in *Poetics* helps to throw light on this issue. In a previously quoted source, Kanellakis specifies that in Ancient Greek "the vocabulary for 'the unexpected' was focussed on the stimulus causing the surprise, rather than on its emotional impact" (Kanellakis 2020: 5). Hence, on this account, the concept of *thauma* refers more to the characteristic of the event than to the reaction it elicited. However, as we will see below, Ancient Greek has grammatical and lexical means to account for both meanings. We get deeper into this question in the following section.

2. Thaumaston *(*θαυμαστόν*) in Aristotle's* Poetics

In the current section we suggest an analysis of the term *thaumaston* (θαυμαστόν) in the passage 1452a1-10 (chapter IX) of Aristotle's *Poetics*:

> But the imitation is not only of a complete action but of fearful and pitiable things, and these come to be both especially or more whenever on account of one another they come to be contrary to expectation? For if this is the case, it will be more wondrous than if they come to be spontaneously or by chance, since even among chance things those seem most wondrous which appear to have come to be as if for a purpose. For example, the statue of Mitys at Argos killed the one who was the cause of the death of Mitys; it fell on him while he contemplated it.

For it is likely that as things of this sort do not come to be at random, so stories of this sort are of necessity more beautiful[4]. (1452a1-10; Aristotle 2002: 28)

In the quoted passage the term *thaumaston* appears for the first time. As we can see, it enters the discourse of *Poetics* as an important element of tragedy closely connected with emotional impact and the structure of action. However, Aristotle never defines this term in an explicit way. Hence, we can only infer its meaning from the context. Based on the passage quoted above, we may conclude that *thaumaston* is achieved through a particular organization of tragic events. In this context, the importance of the causal link between events comes to the foreground, since it contributes to the generation of expectations, violation of which gives rise to the wondrous[5]. Thus, *thaumaston* corresponds to a sort of trap set for the spectator by the author.

Aristotle underlines that such an organization of events is better for achieving *thaumaston* than the case in which events occur spontaneously without being causally interconnected. He explains that "even among chance things those seem most wondrous which appear to have come to be as if for a purpose". Therefore, we see that even spontaneous or random events can be wondrous and, moreover, to varying degrees. The quote presents us with a problem: based on the translation above, one could conclude that the word 'wondrous' refers not only to the result of a particular organization of tragic events, but also to their characteristic. As we will demonstrate, such an interpretation would not be entirely correct.

The observed difficulty can be resolved by referring to the original text. In the passage 1452a1-10 two different adjectives are used that are both translated as *wondrous*. In the first case, this word corresponds to the neuter substantivized adjective *to thaumaston*, which derives from the verb *thaumazo* (θαυμάζω) through the addition (to construct the masculine form) of the suffix *-tos* (Chantraine 1968: 424-5, Kozarzhevski 2002: 125). Therefore, *to thaumaston* is a verbal adjective that expresses the capacity for an action (Kozarzhevski 2002: 125) and could therefore

[4] Orig.: "ἐπεὶ δὲ οὐ μόνον τελείας ἐστὶ πράξεως ἡ μίμησις ἀλλὰ καὶ φοβερῶν καὶ ἐλεεινῶν, ταῦτα δὲ γίνεται καὶ μάλιστα [καὶ μᾶλλον] ὅτανγένηται παρὰ τὴν δόξαν δι' ἄλληλα· τὸ γὰρ θαυμαστὸν οὕτως ἔξει μᾶλλον ἢ εἰ ἀπὸ τοῦ αὐτομάτου καὶ τῆς τύχης, ἐπεὶ καὶ τῶν ἀπὸτύχης ταῦτα θαυμασιώτατα δοκεῖ ὅσα ὥσπερ ἐπίτηδες φαίνεται γεγονέναι, οἷον ὡς ὁ ἀνδριὰς ὁ τοῦ Μίτυος ἐνἌργει ἀπέκτεινεν τὸναἴτιον τοῦ θανάτου τῷ Μίτυι, θεωροῦντι ἐμπεσών" (1452a1-10).

[5] Let us observe that the expression *para ten doxan* (παρὰ τὴν δόξαν) may also be interpreted as "contrary to opinion" (Aristotle 2002: 28).

be interpreted, following Marcello Zanatta's translation, as "that which can surprise" (Zanatta 2004: 609). In this way, *thaumaston* can be interpreted as surprising, and more precisely, as *potentially* surprising.

In the second case, when talking about events that "seem most wondrous", Aristotle uses the word *thaumasiotata* (θαυμασιώτατα), which corresponds to the absolute superlative plural form of the adjective *thaumasios* (θαυμάσιος). This adjective derives from the noun *thauma* (θαῦμα) (Chantraine 1968: 424-5). Since it is a denominative adjective, we can assume that it refers to a qualitative characteristic of the object.

Summarising, we can say that *thaumaston* refers to the *capacity* of the tragic event to arouse wonder, while the adjective *thaumasion* corresponds to the *qualification* of the event as wondrous. The translation by Benardete and Davis does not reflect the difference (even if minimal) in the meaning of the words *thaumaston* and *thaumasion*.

As we have seen, *thaumaston* implies a logical contradiction between expectations and the events that actually occur in the plot. Hence, it seems to likely induce surprise in the spectator. However, it would be erroneous to affirm that this reaction will reliably be elicited in all cases. Thus, surprise and the surprising-*thaumaston* are not one-to-one correspondent and this fact is reflected in the Greek origins of *thaumaston* as a concept referring to a capacity, potentiality. This means that *the surprising* as a characteristic given by the agent to communicate the experience of surprise having taken place, requires a different term. Stepping aside from Aristotelian context of usage, we propose to employ in this case the word *thaumasion*, that refers to the quality of the event, and to understand surprising-*thaumasion* as a phenomenological constatation of the fact that a subjective surprise reaction took place. In this way, we distinguish two types of surprising: surprising-*thaumaston*, that for further clarity will be referred to as *potentially surprising*, and surprising-*thaumasion*, or, in the following, *subjectively surprising*. This distinction resolves the contradiction between surprise as a subjective experience and surprising as a dispositional property.

Let us underline that there is no one-to-one relation between the two types: the potentially surprising does not necessarily induce surprise reaction and thus does not necessarily correspond to the subjectively surprising, yet experience of surprise may serve as an indicator of a potentially surprising event.

As shown below, the two aspects of surprising allow better understanding of the conditions of surprise and of the factors that influence surprise experience. In other words, the proposed terminology helps to

throw light on such questions as: what conditions must be met for surprise to occur, why might the experience of surprise be altered for the same person in different perceptive contexts and why surprise experience may vary across individuals.

For clearer reasoning, we turn to an applied study of surprise in music aesthetics. The reason for this choice, that may seem arbitrary, is twofold. Firstly, one may observe that the experience of surprise implies a comparison between expectations at moment t_1 and the data perceived at moment t_2, thus bringing to light the nature of surprise as a construct that emerges through temporal flow. Therefore, it seems only logical to reflect on the role of surprise in music understood, following in the footsteps of Vladimir Jankélévitch, as an "essentially temporal art" (Jankélévitch 2003: 70). Secondly, as it is suggested by Leonard Meyer, expectation is the central element of music: "one musical event, be it a tone, a phrase, or a whole section, has meaning because it points to and makes us expect another musical event. This is what music means from the viewpoint of the absolutist" (Meyer 1956: 35). According to this framework, music is experienced as meaningful and coherent thanks to the musical anticipations, which, now met, now deceived, highlight the intrinsic connection between music and emotions "specifically cognitive in their bearing – the joy of verification and the feeling of surprise" (Scheffler 2009: 132). Hence, music constitutes a particularly interesting and fertile case for the study of surprise.

3. *The concept of surprise in music*

In the previous section we have formulated a few problems related to the concept of surprise that we intend to resolve through the analysis of music perception. Before we begin, it is important to consider the specifics of application of the concept of surprise in music aesthetics. As we have concluded in the first section, surprise is a cognitive emotion that is elicited in case of perceived discrepancy with beliefs or currently activated schemas.

First of all, it must be said that when we listen to music, we rarely can formulate precise expectations. At the same time, it would be incorrect to think that all expectations in music are unarticulated because, depending on their expertise, one might be able to formulate explicit expectations at a given moment in listening. The simplest example would be a musicologist listener anticipating the resolution of a musical cadence. Therefore,

the question of whether expectations in music are explicit or not is a particular subject that depends strongly on personal preparation and the perception attitudes.

Furthermore, it is difficult to describe musical surprise in terms of binary logic. Turning back to the example of anticipation of a musical cadence resolution, at a particular moment an expert can anticipate (explicitly or not): (1) that the dominant chord would with high probability resolve in tonic: for example, if the musical fragment is in C major, the G major chord would very probably resolve to C major; (2) that with a lower probability a deceptive cadence may take place, and the dominant chord would resolve to another chord (often of the VI-th grade): for example, that the G major chord would less probably resolve to A minor; (3) that with even lower probability the dominant chord takes part in a modulation and thus will not be resolved but will figure as a binding element of a harmonic sequence connecting two different keys: for example, C major and B flat major.

In this case, hearing A minor harmony after G major will not violate an expert's expectation since they previewed several possibilities and a minor was one of them. At the same time, A minor chord may elicit surprise since, when anticipating, a lower probability has been attributed to this option.

This example suggests that in music there is no single "correct" next chord (or another musical element) and multiple continuations can be considered coherent. Consequently, the expectations in music are hardly propositions of a binary nature, in other words, one is not surprised because their anticipation was wrong or was not satisfied. Rather, one is surprised when they perceive one of the options that they considered as less possible. On the one side, this poses a problem for modelling surprise in music, yet on the other side, a solution may be found in altering the understanding of expectation violation and defining surprise as a cognitive emotion that is aroused when a musical event[6] deludes a the listener's belief, which corresponds in this context to a fuzzy set, or in other words a set of pairs of hypotheses (not necessarily articulated) and corresponding grades of certainty that they will actually take place.

The next distinctive feature of music regards causality. If events in everyday life are linked with causal relations thus allowing us to predict and

[6] Under musical event we understand any identifiable musical element that may be perceived as discrete when listening. It could be a melodic, harmonic, rhythmic, dynamic, timbrical or structural event or their superposition.

anticipate contingencies, in music, it is difficult to speak of strict causality between musical events[7]. Indeed, if in a particular fragment of a given piece the note *do* is followed by *la* it is not because *la* is causally related to *do*. Rather, they are interconnected by anticipation created by the preceding element in relation to the following one, based on our knowledge of this musical piece and of our general expertise in music listening. This raises the question of the way in which we can form expectations in the absence of causal relations. To solve this puzzle, it should first be observed that musical expectations may originate from general knowledge of the agent as well as from the so-to-say local knowledge formed during the process of listening to a given piece. To get deeper in this idea, let us consider two examples.

When we talk about music, we intuitively suppose a reference to something that we can hear as a sound. Indeed, our experience (based on which our epistemic background is formed) suggests that listening to music normally implies perceiving various sounds organised in a particular way. This leads us to expect, when going to a concert, to hear sounds. Yet, once, when the concert starts and the pianist reaches the instrument, we hear nothing… For one minute, for two minutes... Someone opens a sweet, someone coughs, someone whispers to the neighbour "what a despicable audacity of the composer", another person takes a note in the diary "silence is not mere absence of sound". We refer here to John Cage's renowned piece 4'33'' that consists of four minutes and thirty-three seconds of so-called silence. The public, while expecting to hear musical sounds, hears only noises of the hall that are normally considered unwelcome in a musical piece, but in this case constitute the piece itself. Thus, a conflict is created with some expectation originating from the general epistemic background of each listener.

However, surely not all music expectations originate from a person's general background knowledge. Let us consider another example: Symphony no. 40 by Wolfgang Amadeus Mozart (1788). The main theme of the first movement is exposed numerous times without changes. Thus, a so-to-speak "local" knowledge base is formed for the piece, such that, when we hear the beginning of the melody, we already can imagine how it will continue. In this way, we can formulate expectations based on what we have learned about the piece while listening. When the composer

[7] Although appropriate theoretical preparation could provide tools to reveal some causal-like relationships.

starts to develop the theme, to play with the melody, modifying it in various ways, the listener may experience surprise, for the form of the melody "learned" from the exposition doesn't correspond to its other forms heard during the development and thus contradicts "local" learned expectations. So, we should distinguish between expectations that arise from our experience in general and local expectations that we formulate based on what we have learned when listening to a particular piece.

Thus, expectation in music may come from our general knowledge as well as from our local knowledge of a concrete piece that we are perceiving at the moment. Especially in the second case, the expectations are arguably a result of *statistical learning*, a term proposed by David Huron that is crucial for understanding the process of music perception. Summarizing his theory, Huron states that "expectations arise through a process of *induction*, in which generalizations are formulated starting from a finite number of specific experiences" (Huron 2006: 359). The author emphasizes that such generalizations are rather "imperfect approximations" and therefore fallible (Huron 2006: 359), which makes surprise possible. Huron refers to the acquisition of knowledge through exposure as statistical learning and introduces the notion of learned schemas, meaning by schema "a mental preconception about the habitual course of events" (Huron 2006: 419). According to Huron, "the experience of surprise implies that the organism has failed to accurately anticipate possible future events" (Huron 2006: 39). Thus, surprise originates in the delusion of expectations, which, in turn, are born from learned schemas.

As we can see, analysing music perception, Huron turns to schema theory, even though, focusing on the application of the approach to music, he does not discuss the underlying psychological theory. At the same time, Huron goes into detail when investigating various types of expectation, distinguishing schematic expectations that correspond to "generalizations learned from exposure throughout a lifetime", dynamic expectations formed starting from immediate experiences (coinciding with the "local" expectations discussed above), veridical expectations, which correspond to knowledge of a familiar sequence of events (like preliminary knowledge of a musical piece that in our terminology takes part of general knowledge), and conscious expectations that find their origins in conscious reflection, or in thought. Such a variety of expectations makes possible the situation in which an event is surprising and non-surprising at the same time (Huron 2006: 363).

Concluding the analysis, we can define surprise in music as a cognitive emotion that is elicited when a musical event is perceived as violating the

beliefs or currently activated schemas. However, describing this mechanism in binary terms (*P* or *not-P*) proves inadequate for music. Rather, listeners form multiple hypotheses about possible continuations, characterising each of them by varying degrees of subjective certainty. Surprise occurs when a musical event corresponds to one of the options that were held less probable. As we have seen, beliefs in music originate from general knowledge and from statistical learning of the piece.

So, though in music it is difficult to talk about causal links between musical events, we can rely on the internal structure of the piece itself since even without causal relations in the strict sense, when listening to music, we may grasp connections or patterns through repetitions, variations, and thematic developments, that allow to form expectations based on statistical learning of the musical discourse and hypothesise how it might continue. This means that the concept of *thaumaston*, which corresponds, in Aristotle's *Poetics*, to a surprise trap, is applicable in the musical context. Consequently, when analysing surprise in music, it is justified to employ the approach proposed above and particularly the distinction between the potentially surprising (surprising-*thaumaston*) and the subjectively surprising (surprising-*thaumasion*). As we argue, recognising this difference is key for resolving important questions about musical surprise. Since surprise is a subjective experience, *which* musical events trigger surprise varies across listeners depending on their expertise, attention, and listening purpose. Additionally, the aesthetical experience of a multifaceted input such as music may vary from case to case even for the same listener. In the following section we seek to establish the reasons and the underlying principles of this variability, by analysing the conditions of the two types of surprising and their particularities.

4. *Surprise and* the surprising *in music*

As a result of the consideration above, we have arrived at an important distinction between potentially and subjectively surprising. This distinction underlines two levels of surprise generation: analytical evaluation of the event as surprising upon creating/performing or analysing the musical piece and practical experience of surprise. We have also observed that potentially and subjectively surprising do not necessarily correspond. If so, what are the conditions in which the event can be considered potentially surprising and under which circumstances do we experience a surprise reaction giving rise to the characteristic of the corresponding event

as subjectively surprising? In the following, drawing on music aesthetics and cognition, we will consider the conditions of the potentially and subjectively surprising, underlining their differences and paying particular attention to the factors that contribute to each.

4.1 *Subjectively surprising*

Let us start from the subjectively surprising. First, it must be said that subjectively surprising as a phenomenological characteristic of an event is a quality attributed to it *after* it has been perceived in case it had triggered the surprise reaction. Thus, we can distinguish three conditions of the subjectively surprising. Firstly, as we can intuit, the event must be consciously perceived. Secondly, it should be perceived in its relation to the context in which it takes place. Thirdly, since subjectively surprising requires that a surprise reaction has been aroused, the final condition is that the perceived event triggers the signal of schema-discrepancy.

It is at this third point that comes to the foreground the fact that experiencing an event as subjectively surprising depends on the schemas at our disposal that we can employ in perceptive processes. This means that people better informed on music in general and on the specific musical piece in particular may experience music in a different way than novices. Another important factor is the involvement in music listening, that is how much the listener is engaged in perception and what kind of engagement it is, what is the purpose of listening. To summarise, we may highlight three key factors that influence surprise experience: the expertise, the involvement and the purpose of listening.

Considering the role of expertise more in detail, we should underline that it does not imply normativity. One may intuitively associate an expert's opinion with the category of correctness or with the category of truth. Yet, since at the centre of our consideration we have personal experience of music, it would be incorrect to impose some precise way of listening as the only true one. Firstly, it means that genuine music experience on the personal level cannot be characterised as "better" or "more correct" depending on the higher expertise. Rather, the experience of music by a novice is *different* from its experience by an expert and, as we will see in the following, not in a reductive way. Indeed, as we have observed in the previous section, expectations in music cannot be right and wrong. Hence, an agent characterising a musical event as subjectively surprising (or not) cannot be right or wrong. The agent's affirmation "this is

surprising" has the nature of a phenomenological observation based on personal experience and it does not imply attribution of an *objective* surprising quality. Rather, it stands for "I found this surprising". Secondly, since surprise exists only as an individual reaction to an external trigger perceived as subjectively surprising, this underlines the fact that music does not contain elements that *should* surprise, but elements that *may* surprise depending on the schemas activated during perception. Thus, music as such doesn't contain surprise, but only *disposition* to surprise that gets realised or not depending on the agent and on the listening circumstances.

One may also observe that musical expertise should not be understood as an innate gift possessed by a select few, but rather as knowledge acquired through exposure and practice. In this way, any novice, thanks to statistical learning, may be considered a potential expert. The key difference is that the expert is more informed than the novice and thus disposes of more schemas related to music analysis. The expert, for instance, may be more prepared in terms of knowledge of traditions and conventions of the musical era in which a piece was composed. This serves them as the tricks to play the game and can help them to experience music in a more detailed way. However, this does not necessarily imply a richer experience. For example, one can be so caught analysing particular details of a piece that they would miss out on its more general architecture and would lack emotional involvement in the music.

We can illustrate this argument with an example of a chess game. One can play chess simply knowing the moves of each figure and inferring consequences of the movements according to their individual capacities. At the same time, an expert, trained to count forward and evaluate the reasons and consequences of each move (both theirs and their opponent's) may be more efficient in predicting the next move and thus in programming the game and their own moves for achieving a checkmate. Both players play chess in a meaningful way, but with different training backgrounds and therefore different kinds of involvement.

Interestingly, the training may also alter the purpose of playing. In chess as in music experience, the more intellectual knowledge is involved in perception, the more danger there seems to be that the game or the music listening transform into a purely intellectual exercise deprived of emotional component (set aside the pleasure of intense cognitive work itself). In this way the novice, who does not possess extensive knowledge on the subject, is in some sense free from this intellectual burden and is more open to taking pleasure of the chess game or of the musical piece

in their less intellectualised form, valorising other aspects of the experience such as communication in chess or emotional involvement in music.

Thus, one may say that a novice is missing out on something compared to an expert, however, many experts as a consequence of extensive training receive a professional deformation, a capacity to perform a professional activity developed till the point that it becomes difficult if not impossible to abstract oneself from it in order to concentrate on a different approach. Such a deformation may push the professional to what could be called analytic listening: a kind of listening in which attention is drawn to examining the structural features of the piece and its particular characteristics. The danger is that the difficulty abstracting oneself from their knowledge may undermine the overall aesthetic experience of music. Usually, expertise is considered an advantage contributing to richer experience and deeper understanding. However, in the limit case, the situation may get reversed to the exact opposite giving the novice the *advantage of not knowing* and thereby the pleasure of exploring and potentially discovering saliences that have not been noticed even by experts[8]. Thus, greater expertise in music may contribute to perceived richness of the musical material and the deepness of its immediate analysis, yet it is not necessary for engaging in music experience and, even more, may occasionally constitute an obstacle to an unburdened, detached experience of music.

Another aspect that plays a key role in the arousal of surprise is the way of listening. For example, absolute listening, in which music is placed at the centre of attention and thus serves as a gravity centre for the current cognitive processes, is drastically different from functional listening, in which music only accompanies other activities and gets specific attention only in the occasional intervals between them.

Talking about the kind of agent's involvement in listening, it is important to underline the particular role of surprise in this matter. Even though involvement is necessary for experiencing surprise as a response to a musical event, surprise can also serve as a means to assure involvement since it draws agent's attention to deviations in musical structures and thereby raises the interest in listening to music, by highlighting its occasional unpredictability. Here the absence of regular or too numerous cases of deviation is extremely important. Indeed, surprise is hardly pos-

[8] However, one may rightly propose a counterexample: experimental art that in some cases is close to be incomprehensible for somebody not sufficiently informed about it.

sible if the musical material *consists* of deviations. Arguably, such a composition would not induce a large number of surprise reactions but would rather elicit the incessant and probably unsuccessful search for patterns that would give the listening purely explorative character of *learning about something new*.

4.2 *Potentially surprising*

Let us now turn to the *potentially surprising* and its conditions. As we have concluded above, the potentially surprising is to be understood as an evaluative characteristic of an event which has such structural features that in the context in which it takes place it is likely to reveal itself as deviant. In other words, the potentially surprising is conditioned by the possibility of analytical demonstration of contextual deviance that assures the disposition to elicit surprise. It should be noted that the effective *perception* of this deviance is completely up to the listener, which highlights the connection between potentially and subjectively surprising.

One would be right to object that such an approach reveals a certain vagueness and raises several questions. If surprise reaction strongly depends on individual perceptive attitudes and knowledge, (1) how it is possible to evaluate an event as potentially surprising, and (2) doesn't this contradict the absence of surprise normativity discussed above? And most importantly, (3) if there is a way to evaluate an event as potentially surprising, are there conditions under which it can be considered *objectively* surprising? In this final fragment of the section, we will throw some light on these problems.

As we can conclude from the above, surprise reaction may be volatile since it depends on the agent's capacity to form expectations on the basis of perceived musical material. Surprise can be triggered by a deviant musical event, but it depends on the agent whether the surprise reaction actually takes place. So, how can we possibly predict which events are likely to surprise the listener? On the one hand, the reply resides in the fact that potentially surprising refers to nothing more than an observation of a *disposition* to surprise, which does not guarantee nor imply perception of the event as subjectively surprising.

On the other hand, even though surely not all musical events are disposed to elicit surprise, arguably, there may be distinguished ones that are susceptible to it, since they stand out by some parameters in their musical context. Such parameters may be rhythm, melodic succession of

notes, harmony, timbre, dynamics, particular compositional choices confronted with the era to which the musical piece belongs and specific interpretation decisions as considered in light of the historical and contemporary conventions. This said, evaluation of an event as potentially surprising implies analysing musical material in terms of patterns and regularities in the musical discourse and singling out deviations from these patterns that correspond to Aristotelian *thaumaston*. Such a process, though, would not be more than a sophisticated intellectual game, hadn't it been completed by an examination of how likely the individuated patterns and the corresponding deviations are to be grasped by the listener *in situ* giving rise to a surprise reaction[9].

To illustrate this point, let us consider an example: a baroque toccata in which the composer uses enharmonic modulations[10]. From the theoretical point of view, usage of enharmonic equivalence is not characteristic for baroque music and thus, an example of this technique in a baroque piece may be characterised as potentially surprising (*thaumaston*). However, for the listener to qualify this aspect as subjectively surprising (*thaumasion*), three conditions must be met: (1) the usage of enharmonic equivalence has to be acknowledged (yet it can easily be left unnoticed since enharmonic relations do not contradict the inner coherence of harmonic sequence and thereby may not draw attention of an inexperienced listener); (2) the usage of enharmonic equivalence has to be consciously perceived in the context of baroque music, that assures its unexpectedness, since enharmonic modulations detached from baroque context represent one of the basic compositional techniques of later époques (for instance, the impressionism era); (3) the enharmonic modulation has to be recognised as deviant from usual baroque musical patterns, thus triggering surprise reaction. As we see from this example, the potentially surprising and the subjectively surprising can coincide, though the bridge from the first to the second stands on three relatively unstable points.

So, we have demonstrated that potentially surprising does not imply perception of the event as subjectively surprising. As we have mentioned above, surprise and the surprising lack normativity, that is perception of

[9] This task is particularly important in the process of composition in case the author intends to elicit surprise in listeners at a particular point. In this case, the composer who knows their public with its particularities has the advantage of better predicting the reaction of the listeners to one or another deviation from the schemes.

[10] An example of such a piece may be found among organ works of Johann Ernst Eberlin (1702-1762) and namely in the Seventh Toccata of *IX. Toccate e Fughe per l'organo* (1747).

an event as surprising cannot be neither correct, nor wrong. However, if it can be demonstrated that an event is potentially surprising, and yet if it did not elicit surprise in the agent, does it mean that the agent perceived it incorrectly? The reply is a certain no. First, as we have underlined above, the potentially surprising events constitute a *disposition* to surprise. This disposition can be characterised as objective, since it resides on logically demonstrable contradiction between a pattern and a musical event. Nevertheless, the category of objectivity in this case is applicable only to the disposition and not to the characteristic of the event itself as surprising. This means that even though one can find objective reasons to classify an event as potentially surprising, this does not impose the necessity of surprise reaction to this event. Indeed, in case an agent does not know that enharmonic modulations are not characteristic for baroque music, they will not be surprised by the example considered above. Affirmation that they *should* have been surprised would imply that they should have been informed on the baroque conventions. This could be interpreted as indication of (potentially shameful) lack of knowledge when in fact the discourse originates from musicological considerations that may be completely irrelevant for the agent who may have been listening to the mentioned toccata for the simple reason that it makes them feel joyful.

Thus, there is no instruction as for what should and should not surprise the listener. Since different schemas may be activated during perception in different agents, they may engage in aesthetic experience in different ways, paying attention to different aspects of musical material. Consequently, the listeners may grasp different saliences from the same interpretation of the same musical piece. But, if one may individuate an objective disposition to surprise, which does not guarantee a surprise reaction, how can we approach the question of objectively surprising? As we argue, since surprise exists only in individual experience as a subjective reaction to the perceived data and since surprise does not imply any kind of normativity, one can hardly apply the category of objectivity when evaluating events as surprising. Yet we know that certain events elicit surprise in listeners more often than other ones and we know that some events give rise to surprise for some agents while leaving others unimpressed. This indicates that the only way in which surprise objectivity may be addressed is through a statistical study of events characterised by listeners as subjectively surprising.

Summarizing the discourse of the present section, we may say that surprise in music should be understood as a subjective reaction to a surprising musical event. In this context it is important to distinguish between the potentially and the subjectively surprising. As we have demonstrated, characterisation of a musical event as potentially surprising refers to its objective disposition to surprise. Nevertheless, it neither guarantees, nor imposes actual arousal of a subjective surprise reaction. On the other hand, if the listener experiences surprise in response to a particular musical event, they may characterise the event as subjectively surprising. As shown above, since different agents engage in music experience in different ways, employing diverse perceptive schemas, and in view of the strong contextuality of surprise, the categories of truth, correctness and objectivity are hardly applicable to surprise and the surprising.

Conclusion

In this study, analysing the concept of surprise in terms of contemporary philosophy, we identified certain conceptual problems. As we argue, the key to their resolution lies in recovering the Ancient Greek terms *thaumaston* and *thaumasion* from Aristotle's *Poetics*. By applying them in the current investigation, we have distinguished between the *potentially* and the *subjectively* surprising that correspond respectively to disposition to elicit surprise and to actual surprise experience. This distinction allowed us to construct a framework that reconciles tensions concerning the concept of surprise and its perception in music.

The discussion of the conditions of the two types of surprising and of the aspects that influence surprise experience has brought to the foreground the absence of normativity in surprise reaction and the inapplicability of the category of objectivity to the concept of surprising. At the same time, we have observed that the potentially surprising events reveal an objective disposition to surprise, assured by a logically demonstrable deviation of these events from the patterns, characteristic for their respective context. We have furthermore underlined the contextuality of surprise that complicates analytical evaluation of events as potentially surprising. Finally, we have highlighted the utility of statistical study on surprise[11] for deeper understanding of this reaction and its causes in music.

[11] Previewed as a part of doctoral research of the author.

In conclusion, the proposed approach bridges ancient and contemporary aesthetics through Aristotle's *thaumaston* while resolving a puzzle: if surprise is an individual experience, how can we attribute the quality of surprising to the musical elements that elicit surprise? By distinguishing dispositional properties from subjective responses, we proposed a solution that preserves analytical precision while acknowledging the genuine variability of surprise and its individual nature without implying any constraints on the aesthetic experience.

In this study we have focused on the canonical Western-European instrumental classical music. The discussion may be taken further by applying the proposed ideas for an analysis of contemporary music that constitutes a particularly interesting but at the same time challenging case for the investigation of musical surprise. On the one hand, experimental music artists question or highlight the most unexpected aspects of music and its perception, thus making contemporary music a particularly fruitful ground for research on surprise. On the other hand, however, contemporary music requires a specific approach and an appropriate theoretical framework that are indispensable for understanding the ideas behind the artworks and grasping their depth often veiled in apparent simplicity.

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