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## PLEASANT MUSICAL IMAGERY: ELICITING CHERISHED MUSIC IN THE SECOND PERSON

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**THIS ARTICLE INTRODUCES THE NOTION OF** *pleasant musical imagery* (PMI) for denoting everyday phenomena where people want to cherish music “in their heads.” This account differs from current paradigms for studying musical imagery in that it is not based *a priori* on (in)voluntariness of the experience. An empirical investigation of the structure and experiential content in 50 persons’ experiences of PMI applied the *elicitation interview* method. Peer judgments of the interviews helped to bridge a phenomenological investigation of particular experiences with systematic between-subjects analysis. Both structural features of the imagery (e.g., *Looseness* of structure or *Looping*) and content features of the imagery (e.g., *Embodied evocativeness* and *Object-directedness*) showed significant associations with participants’ individual characteristics, personality, and/or cognitive style. The approach taken suggests a new paradigm for studying musical imagery—one that is based on tracing the interactional and enactive processes of “inner listening.”

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**Key words:** elicitation interview, enactive processes, evocativeness, human-music interaction, musical imagery

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**I**MAGINING MUSICAL SOUNDS, “PLAYING MUSIC in one’s head” while no actual sounds are to be heard, is a prevalent phenomenon (see Bailes, 2006, 2007, 2015). Much of the recent interest concerning musical imagery in everyday life has focused on *earworms*, often equated with *Involuntary Musical Imagery* (INMI; e.g., Floridou, Williamson, Stewart, & Müllensiefen, 2015; Liikkanen, 2011; Williamson et al., 2011; but see Williams, 2015). In an internet survey, Liikkanen (2011) found out that 33.2% of the

respondents reported experiencing INMI every day—most often imagining a single repeated part of a piece of music. This corresponds to Brown’s (2006) self-descriptive, phenomenological account in which the author reported his involuntary “perpetual music track” to consist mostly of looped fragments of recently heard and familiar pieces of music (see also Beaman & Williams, 2010). In another survey study, Floridou and colleagues (2015) used factor analysis to abstract four dimensions of INMI experiences: *negative valence*, *movement* (in sync with the imagined music), *personal reflections*, and *help* (given by the imagery in focusing on other things). The three latter factors were found to be positively correlated with the frequency of experiencing INMI, which appears to suggest that individuals who frequently experience INMI often find meaningful connections between such imagery and their other life experiences. Indeed, contrary to the popular belief concerning irritative earworms, research suggests that INMI experiences are often rather pleasant (Beaman & Williams, 2010; Halpern & Bartlett, 2011; Hyman et al., 2015). Nevertheless, in this area of research, the phenomenon of interest has been musical imagery as an “involuntary, spontaneous, cognitive intrusion” (Williamson et al., 2011, p. 277).

There are also traditions of thought focusing on *voluntary* musical imagery (VMI). Musicians speak about “mental practice” when referring to preparation for musical performance that occurs away from the physical instrument, and this may often involve silent imagery of musical sounds (Fine, Wise, Goldemberg, & Bravo, 2015). In music education, Gordon (1984) called imagining music silently *audiation*, proposing it as a central musicianly skill. There is empirical evidence that music training indeed enhances abilities of voluntary imagery for sounds (Aleman, Nieuwenstein, Böcker, & de Haan, 2000; Bailes, Bishop, Stevens, & Dean, 2012). In fact, musical imagery may engage many of the same resources as listening or producing musical sounds does—for instance, involving covert excitation of the vocal folds (Brodsky, Kessler, Rubinstein, Ginsborg, & Henik, 2008). Apparently, auditory imagery is not just limited to sonic experiencing but often involves embodied and multimodal enactments (e.g., Tuuri & Eerola, 2012), thus

incorporating sensorimotor couplings (Varela, Thompson, & Rosch, 1991) between sounds and actions.

Much of the research, then, has approached musical imagery by using (in)voluntariness for demarcating the phenomenon at hand. VMI has been taken as a musicianly, technical skill, appropriately studied in experimental settings, whereas INMI has been understood as an informal everyday phenomenon to be addressed through surveys, diary studies, or anecdotal evidence. Indeed, there is research suggesting the separateness of these two phenomena (Weir, Williamson, & Müllensiefen, 2015). Notice, however, that involuntariness might be too easily taken for granted as the primary defining criterion of everyday musical imagery, as, for example, when participants are told what INMI is before asking them to account for such experiences (e.g., Liikkanen, 2012). In fact, as soon as researchers report that some individuals might *control* their INMI (e.g., Williamson, Liikkanen, Jakubowski, & Stewart, 2014), the notion of involuntariness has become questionable. In the present study, we propose a different approach to everyday musical imagery—one in which involuntariness does not play a similar defining role (see also Wammes & Barušs, 2009), but which rather turns to voluntary imagery as a methodological tool to approach *any* sorts of musical imagery processes.

The focus for our work is defined as the intersection of musical imagery—whether voluntary or involuntary—and another phenomenon that has typically been treated as a separate matter, namely *pleasant musical experiences*. Whether the emphasis has been on the characteristics of powerful musical experience itself (Gabrielsson, 2008, 2010; Schäfer, Smukalla, & Oelker, 2014), or on the listener's way of understanding the aesthetically valued music (e.g., Hesmondhalgh, 2007), pleasant musical experiences have usually been framed in terms of actual listening. Very little research seems to have been conducted on people's ways of voluntarily imagining their favorite music. In Gabrielsson's (2008) compendium of strong experiences in music, for instance, only a handful of the accounts deal with "inner music," and these concern unique, subjectively unexplainable experiences of "hearing" music when there was nothing to be heard ("musical hallucinations": Evers & Ellger, 2004; Hemming & Merrill, 2015), rather than everyday imagery.

One of the only serious attempts to study the imagery of favorite music that we are aware of is Marko Aho's (2008) phenomenological case study of his own experiences of entertaining himself in a tedious factory job by listening to music in his "internal jukebox." While claiming no generality to his findings, Aho suggests

ways in which a piece of music, in the course of repeated inner listenings, may become subject to extensive durational and structural variation. Aho (2008, p. 127) outlines five "means of variation in internal listening":

- *Looping* of short passages (e.g., especially satisfying moments or climaxes) potentially continuing *ad infinitum*;
- *Expansion* or "savoring" while focusing on especially "delicious" points in the musical stream (e.g., individual sounds left sounding in the imagination);
- *Deletion* of subjectively irrelevant portions from some passage;
- *Combination* of originally separate features or moments of the piece;
- *Preparation* for a climactic moment.

We may notice that Aho's (2008) means of internal variation need not be justified as effective or information-preserving ways of recalling and mentally handling a piece of music. This is not only evident in such creative distortions as seem to be involved in Expansion, Deletion, and Combination, but also in the conception of structural significance implicit in the account. Instead of diligently imagining the piece as "patterns of essential notes" (as in Gordon, 1984, p. 16), Aho (2008, p. 128) describes highly intentional choices of "especially satisfying moments" that he would tend to "savor and temporally curb." We will use the term *pleasant musical imagery* (PMI) to refer to such experiences of imaginative cherishing of music in the mind. "Pleasantness" is here understood as any kind of subjective meaningfulness—as in providing relief from tedious labor. We see no *a priori* reason to assume that PMI experiences would have to be triggered voluntarily, or that they would always be involuntary. As Aho's account suggests, however, such experiences may be open for voluntary, introspective access.

The phenomenon of PMI poses a methodological dilemma: Is there any way to study such a first-person phenomenon within a third-person framework—with methods allowing systematic observation and comparison from an intersubjectively shareable perspective? For most of the past century, introspective accounts were suppressed from scientific psychology as unreliable, leaving phenomena akin to PMI for theorists of other persuasions (e.g., psychoanalysts: Reik, 1953). Lately, the picture has been changing through the development of so-called *second-person methods* in the study of consciousness (Olivares, Vargas, Fuentes, Martínez-Pernía, & Canales-Johnson, 2015). Here, special interview techniques are applied to gain comparative access to various persons' first-person perspectives. Moreover, the introspective data obtained should also be "inserted

into a framework of research which makes it possible for it to be correlated with other sets of data obtained independently” (Vermersch, 1999, p. 30).

Our starting point will be the second-person technique known as *explicitation interview* (Petitmengin, 2006; Vermersch, 2003), also referred to as *elicitation interview* (e.g., Petitmengin & Lachaux, 2013), developed for making explicit the pre-reflective aspects of individual experience. The interviewee is guided to *re-enact*—imaginatively live through—a chosen previous experience. The interviewer strives to stabilize and maintain the interviewee’s attention on *how* a certain experience folds out—how it begins, how it continues, etc.—instead of *what* it is in terms of learned general categories, or *why* it is like it is. Hence the interviewee is gently guided to examine the inherent qualities of the experience, instead of, say, producing rational explanations for it. The interviewee is encouraged to re-examine parts of the experience that might be overlooked or even appear inaccessible in a traditional interview situation. Responses such as “I don’t know” are thus retorted by the interviewer by “content-empty” follow-up questions such as “What is it that you don’t know when you don’t know?” (Vermersch, 2003, pp. 136–140). Such facilitation can significantly increase the subject’s ability to consciously access decision-making processes. In a “choice blindness” paradigm (in which subjects do not detect a manipulation and provide explanations for choices that they did not make; Johansson, Hall, Sikström, & Olsson, 2005; cf. Nisbett & Wilson, 1977), participants facilitated this way noticed that their previous choices had been manipulated in 80% of the trials, against 33% in trials not followed by elicitation interview (Petitmengin, Remillieux, Cahour, & Carter-Thomas, 2013). It is relevant to note that Petitmengin and her associates have also applied this interview method in exploring the experience of heard sounds, including musical ones (Petitmengin et al., 2009).

In the following, we will attempt to bridge first-person reports of musical imagery, through second-person interview methods, with systematic research in the third person. Our approach involves diachronic analyses of the experiential structures of imagined listening sequences as well as trained panelists’ ratings of synchronic aspects of these experiences. The use of peer judgments provides one potential solution to the problem concerning the validity of experiential reports. A central aspect of this pertains to judging if and to what extent the interviewee is in an *evocative* state; i.e., genuinely in contact with her/his immanent felt dimension of the experience (Petitmengin 2006, 2007).

Petitmengin (2006) offers some diagnostic guidelines for judging evocativeness: For example, individuals would often start using the present tense in attempting to verbally express the evocation of the experience (verbal clues), and they would often seem to start staring at the horizon as they turn inward to examine their own experience (non-verbal clues). By externalizing to trained judges some of the interpretative burden involved in analyzing such phenomena, we want to avoid the results merely reflecting our own biases concerning evocativeness or our prejudices concerning the participants.

By quantifying second-person interview data through expert ratings, we may then correlate information concerning PMI with data from other measurement instruments. We will specifically relate our second-person results to features of personality and cognitive style, with the working assumption that such stable individual features might, in part, account for the types of structures and contents taken by the imagery. In a rare study directly addressing the connections between personality and “spontaneous musical imagery,” Wammes and Barušs (2009) prompted the participants to describe “any music in your head right now” and ran a principal component analysis on survey items concerning the imagery, finding some of the components to correlate with personality traits. Connections between imagery and personality (e.g., Rasmussen & Berntsen, 2010) or imagery and cognitive style (Vannucci & Mazzoni, 2009) have also been observed outside of musical contexts, suggesting the potential fruitfulness of such approaches. At the present state of research, however, we need to address such relationships in a rather exploratory fashion.

In this study, we chose to conduct 50 elicitation interviews with music students regarding their experiences of imagining their favorite music. The decision to interview music students was made on methodological grounds: We hoped that applying the second-person approach in the context of musical imagination would be safest to begin with individuals who may have an interest in describing such experiences (see Petitmengin, 2001). On this basis, we addressed two broad research questions: 1) What kinds of structural features and experiential content are involved in PMI? 2) Are such aspects of structure and content in PMI associated with individual differences between the participants?

Apart from our research interest in musical imagery, we hoped to contribute to the existing literature on second-person methods in two ways. First, as noted above, we wanted to explore injecting second-person data into a quantitative, third-person framework. Second, pioneering second-person methods in the

TABLE 1. Participants' Musical Background and Activities

		All participants ( $n = 50$ )		Expert panelists ( $n = 17$ )	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Musical experience (years)	Active music-making	14.7	8.4	19.6	10.0
	Taking formal music lessons	10.0	6.7	14.0	7.3
Weekly time consumption (hours)	Playing music or singing	6.9	6.2	6.8	8.0
	Music listening	15.3	14.6	8.7	7.1
	Watching movies or TV	6.3	6.8	5.1	3.5
Number of instruments played		2.6	1.2	2.6	0.9
		% of all participants		% of expert panelists	
Playing music / singing in given styles (at least once a week)	Popular	82		82	
	Classical	50		59	
	Jazz	24		29	
	Folk	16		18	
Other activities (at least once a week)	Composing	34		29	
	Improvising	56		53	
	Writing about music	52		76	
	Teaching music	22		47	

psychology of music may have some theoretical interest beyond music research. This is because the phenomenon studied here differs in one significant aspect from the kinds of experiences previously approached using these methods. When past experiences such as the early symptoms of an epileptic seizure are re-evoked in the interview situation (Petitmengin, Navarro, & Le Van Quyen, 2007), this constitutes another lived experience, distinct from any past one (see Vermersch, 1999). The experience of PMI in the interview situation might similarly reference an earlier experience, but then again, it need not. In asking a person to imagine a piece of music, our interest lies in the immanently present experience that is elicited there and then. In this respect, the term "elicitation interview" appears especially appropriate in the case of musical imagery.

## Method

### PARTICIPANTS

The participants were 50 university music students (26 females, 24 males), including 38 musicology majors and 12 musicology minors, taking part in an introductory class on the psychology of music ( $n = 40$ ) or in an advanced class on embodiment in music research ( $n = 17$  out of which 7 also took part in the first course). The latter, generally more experienced subgroup took part in the main study like the rest of the participants, but also served as expert panelists. The whole participant group had a mean age of 26.5 years ( $SD = 8.3$ ; experts:  $M = 32.2$ ,  $SD = 10.6$ ), and they were, on

average, in their 3.5th year of university studies ( $SD = 2.0$ ; experts:  $M = 4.5$ ,  $SD = 2.9$ ). Seventeen of all participants (12 of the experts) also had a previous professional degree in music from a conservatory or applied university. The participants' musical background and activities are reported in Table 1 separately for the whole group and for the subgroup of expert panelists.

### MUSICAL SELECTION

Before the interviews, the participants received instructions informing them that the topic of the discussions would be "our mental musical experience." It was noted that people may sometimes speak of music "getting stuck in their heads" as irritating, but that at other times, such experiences might feel welcome: "It is as if the person would be *cherishing* personally important music in his/her mind, 'listening' to it with pleasure in the imagination—perhaps half unconsciously, perhaps sometimes in a conscious manner." The participants were then asked to "identify one piece of music that you have cherished like this—a piece that feels welcome when it surfaces in your mind." They were asked to find a recording file of the piece and send it to the interviewer, but not listen to the recording before the interview. None of the participants questioned or complained about the task, and they all submitted the recordings before the interview.

### INTERVIEW PROTOCOL

Adapting from Petitmengin (2006) and Vermersch (2003), we developed a set of guidelines that the

TABLE 2. Interview Guidelines as Applied in the Study

Opening	<b>Leading discussion.</b> “The topic is cherishing music in the mind.” “Since when has the piece been in your life?” “When you imaginatively hear the piece in your head, what triggers this experience?” “Where in the piece might the experience begin?”
Elicitation Interview	<b>Focusing and establishing contact with the experience.</b> “Hey, let us allow the music to come to this situation. Listen to it for a while in your mind at your leisure, and tell me then what you heard and experienced.”
	<b>Deepening the contact with the experience (synchronic aspects):</b>
	<ul style="list-style-type: none"> <li>– Open questions concerning the qualities of the experience: “What was the experience like?”, “How does it happen?”</li> <li>– Empty follow-up questions, referring to experiences already mentioned by the participant: e.g., “When you [experience this], what is it that you [experience]?”</li> <li>– Specification after repeated listening: “You said that [you experienced X]. Could you listen to that passage again and tell me what happens when [you experience X]?”</li> </ul>
	<b>Assisting the participant by references to other senses (synchronic aspects):</b>
	<ul style="list-style-type: none"> <li>– Suggesting various alternative kinds of description. Basic question: “Were there any experiences of motion, bodily sensations, or visual images?”</li> <li>– Particularizing the experience (e.g., “What do you see around you?”, “How do you feel?”, “Is it hot or cold?”, “Is it light or dark?”).</li> </ul>
	<b>Temporal folding-out (diachronic aspects):</b> Asking to listen to the entry into the passage previously described and/or to the continuation of the experience from there.
Closing	<b>Indexing and clarifying the temporal structure of the experience:</b> Listening together to the original sound recording and having the interviewee indicate musical passages that would correspond to the experiences described.

interviewer would internalize and follow in the course of each interview (see Table 2). Each interview began with an icebreaking discussion about inner listening and its contexts. After this, the elicitation interview proper began by “guiding the person towards focusing on a singular lived experience” (Vermersch, 2009, p. 42). In an informal fashion, the interviewer gave a prompt to mentally “listen” to a passage of the music for a while, and then to describe the experience. After initially directing the participant’s focus on the experience, the interview progressed by incorporating the techniques mentioned in Table 2, as needed. The elicitation interview proper was followed by listening to the audio recording of the piece and having the interviewee indicate the locations of the experiences earlier described.

The elicitation interview part itself was a cyclic process in which the interviewee was repeatedly asked to focus on and/or re-enact a particular aspect in his/her experience. A pivotal purpose of this process was to establish and maintain a focused evocative state. To guide the participant in exploring the synchronic aspects of an experience, the interviewer primarily used content-empty follow-up questions. If the participant appeared to need evocative strengthening of the experience, the interviewer asked her/him to mentally listen to the same passage again, now focusing on an aspect that had already been mentioned about the experience.

If the participant seemed to have problems in finding an evocative contact with the experience, or in freely speaking about it, s/he could be helped by “spontaneously” suggesting a number of potential kinds of accompanying experience (“experiences of motion, bodily sensations, or visual images”). Alternatively, the interviewee might be helped to particularize a previous rudimentary or generalized description through a series of quick follow-up questions concerning other sense modalities that might be involved. Diachronic aspects of the experience would also be addressed by asking the participant to continue listening ahead from the location already discussed or, when relevant, by starting the listening from an earlier location in the piece.

The interviews were conducted individually by one interviewer (Huovinen). The interviewer and the interviewee sat facing one another, their chairs being placed “informally” about 135° apart from one another around a small round coffee table. A video camera was mounted on a stand on the other side of the facing discussants, 3 m from the interviewee and at a 45° angle on the right from the interviewee’s direction of gaze when s/he was facing the interviewer.

#### PRELIMINARY ANALYSIS

The mean duration of the video-recorded interviews was 37’50” ( $SD = 5’19”$ ), their total duration amounting to 31.5 hours. The first sequences of inner listening

appeared, on average, at 4'26" from the beginning of the interview ( $SD = 1'22''$ ). These first listening passages had a median duration of 14" of silence ( $M = 23.7''$ ,  $SD = 23.2''$ ). For the rest of the interviews, exact information concerning total duration of inner listening would be a matter of interpretation, as some interviewees quickly learned to intersperse their talk with briefer moments of "checking" something in their inner experience.

Due to the interview technique, accounts of inner experiences were gradually folded out during longer spoken exchanges that included sections of inner listening. The chronology of the interview thus rarely if ever corresponded to the chronology of one continuous "listening" experience. For a better overview of the participants' experiences, the interviewer wrote summaries of the spoken content of each interview, including partial transcriptions of key passages. The purpose was to collect all available information concerning the structural features of inner listening, and to select the most evocative passages (see below). This yielded a summary document of 50 full single-spaced pages.

#### RATING THE EVOCATIVE SECTIONS

Using the interview summaries, the interviewer selected from each interview what appeared to be the most evocative 3–4 minute section (mean duration 3'28", total duration of the 50 excerpts 173'30"). These always occurred later than the very first section of inner listening, taking place at 17'21" from the beginning of the interview, on average ( $SD = 7'17''$ ). While this initial selection process relied on one researcher's individual interpretative judgment, its function was to distribute responsibility for the main ratings themselves to a panel of experts. Videos of these sections were extracted from the interviews, arranged in a random order, and compiled as a playlist for video rating sessions.

A subgroup of 17 participants was also trained as expert panelists. After their own elicitation interviews, these participants, attending an advanced class on embodiment, received instruction concerning the theory and practice of the elicitation interview and the concepts central to the rating tasks (e.g., evocativeness). Each of these participants was invited to one of three rating conferences, each expert panel meeting for two separate 2-hour sessions during one day. The panelists first rated two practice videos from a pilot interview between the two authors. A discussion concerning the panel members' understanding of the rating criteria ensued, intended as a corrective for any highly discrepant understandings of the criteria. Subsequently, the panelists individually rated all 50 videos without mutual

exchanges. The panelists were oblivious to the reasons for seeing exactly these interview snippets and they left their own interviews unrated. For each panelist, their own prior participation in the interview thus served as an essential first-hand experience for understanding the activity in question (see Petitmengin, 2001), but their "expert" status was developed only after their own interview, none of the panelists rated themselves, and none of them knew the precise aims of the study.

The rating scheme is given in the Appendix. Four-point rating scales were used throughout. Briefly, the experts in Panel 1 ( $n = 6$ ) rated the interview sections on an "evocativeness scale," judging the closeness of the interviewees' accounts to their lived-through experiences. Four different alternative positions were defined, from an evocative one—in which the person "describes a particularized, lived-through experience in a tangible and animated manner, concretizing lived presence in the moment"—to one in which the experience is described in abstract, general terms. Panel 2 ( $n = 6$ ) rated the videos for aspects of spoken (or gestured) content: references to movements, embodiment, agency, objects, and autobiographical aspects. Panel 3 ( $n = 5$ ), in turn, rated the interviews for qualities having to do with how the interviewees related to their experience, and how the interactive dynamics of the situation played out.

#### MEASURES OF PERSONALITY AND COGNITIVE STYLE

Two tests of individual characteristics were administered. First, we used the "Short Five" (S5) personality test (Konstabel, Lönnqvist, Walkowitz, Konstabel, & Verkasalo, 2012), measuring the 30 facets of the Five-Factor Model with 60 comprehensive single items (positive and negative statements intended to match expert descriptions of the constructs). For the Finnish-language version used here, Konstabel et al. (2012) report good to excellent congruence with the standard NEO PI-R structure. Second, we used the *Object-Spatial Imagery and Verbal Questionnaire* (OSIVQ), which is a test of cognitive style, addressing three separate dimensions of object imagery, spatial imagery, and verbal tendency (Blazhenkova & Kozhevnikov, 2008). The version used was the official Finnish translation (available from MM Virtual Design, LLC), slightly adjusted by us to better match the English original.

### Results I: Structural Analysis of Imagined Music

#### IMAGINED MUSICAL UNITS

With the help of the interview summaries, we worked out a set of analytical concepts for structurally analyzing

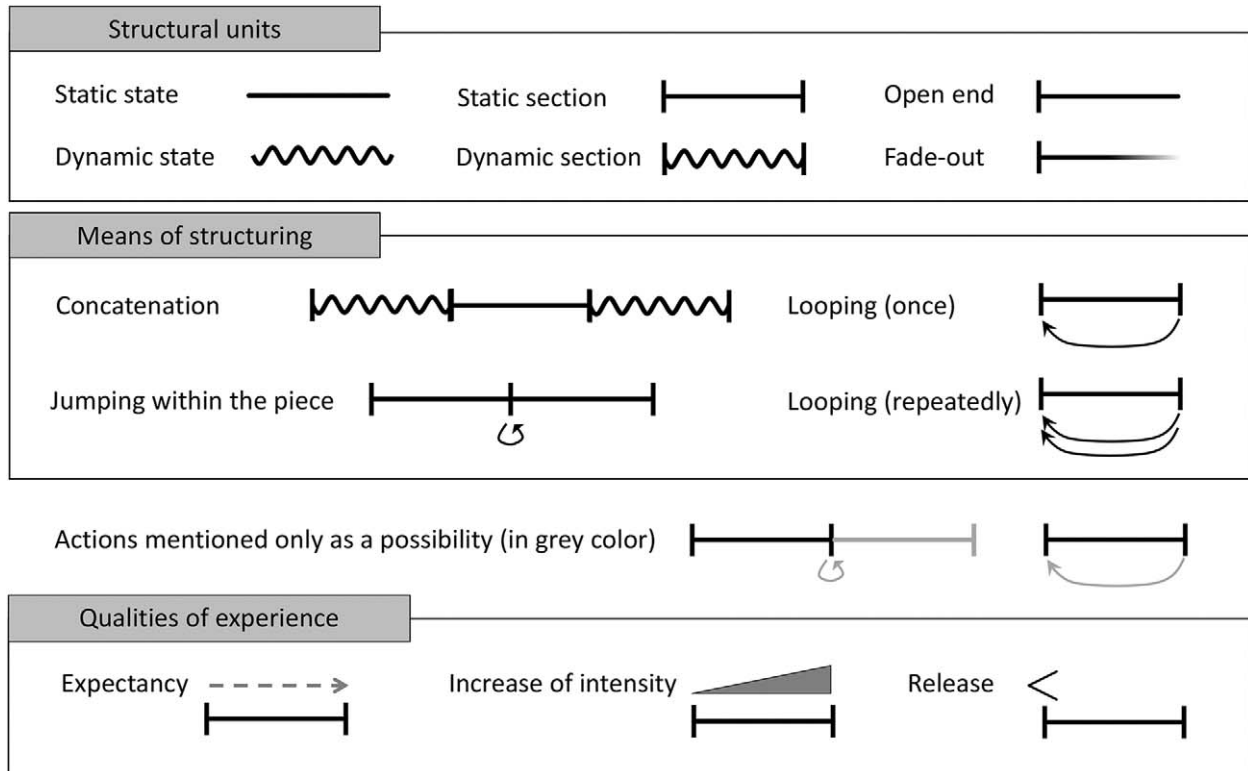


FIGURE 1. Basic analytic symbols for a structural analysis of the sequences of inner listening.

the imagined music (see Figure 1). First, two types of *units* were distinguished in the inner listening experiences. *Sections* would be units marked off from other parts of the experience either by music-structural expressions (e.g., “chorus,” “guitar solo”) or by indicating their temporal starting and/or end points. *States*, in turn, would lack both of these identifying features (e.g., “a warm feeling”). While only three participants suggested states, we include the distinction, as the preponderance of sections may, in fact, be due to the musical education of our participants. At times, sections might be accounted for only at their beginning, leaving the description *open* at the end (17 cases), or they might be explicitly mentioned to *fade out* in the experience (4 cases). For a first, rough understanding of experiential qualities within such units, we further distinguished between *dynamic* units (31 participants) and static ones (27 participants), depending on whether or not some inner change or experience of motion was indicated.

#### STRUCTURAL DEVICES

A participant’s account could either comprise a single section (or state), or several such units could be *Concatenated* with one another. *Looping* of one or more

sections was also attested: Our arrow symbols indicate whether the participants suggested returning to a previous location once, or whether they spoke of repeated *Looping*. Another frequently occurring device was a consciously recognized *Jumping* to a location that would not follow directly in the “original” reference version of the piece known to the participant. Importantly, we are not concerned with “actual” variations with respect to the original version: Shuffling between various non-contiguous musical units is only relevant to our concerns when the participants themselves indicated an awareness of the “incorrect” transition. Our analytical scheme also differentiates between cases where *Jumping* or other structural features were mentioned *tout court*—as simply what happens in the experience (shown in black color)—and cases in which similar features were mentioned as something that “perhaps” or “sometimes” might happen (shown in grey).

Certain kinds of qualitative changes occurred often enough to merit their own analytical categories. In particular, sections might be accompanied by an experience of *Increase of intensity* or tension (15 participants), typically indicated as terminating at a particular location in the piece. Interestingly, corresponding gradual



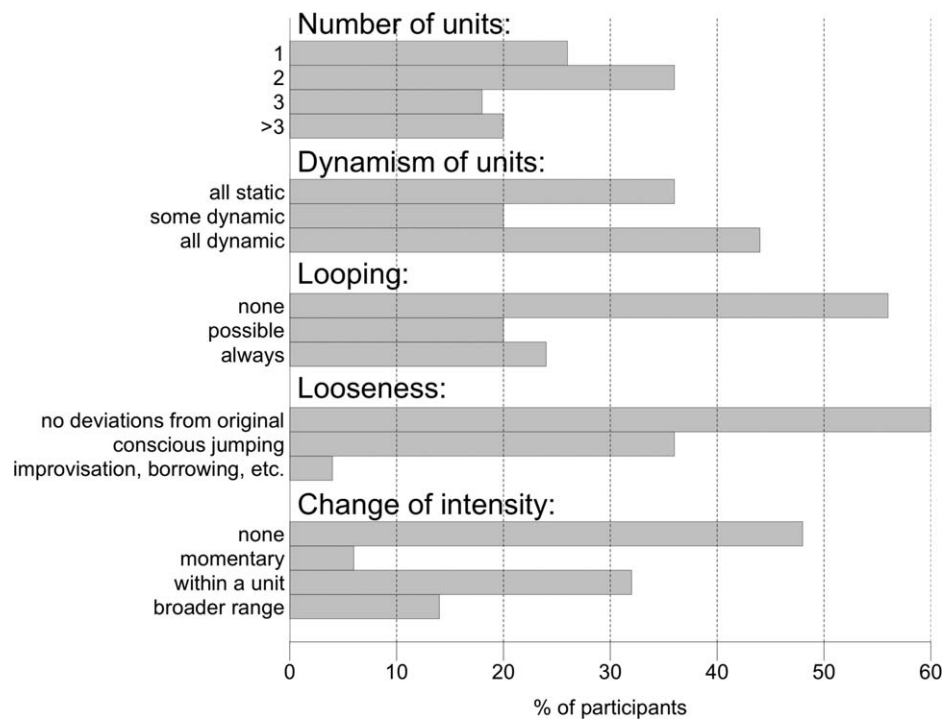


FIGURE 2. Prevalence of key structural features in inner listening.

decreases in intensity only figured in few (3) participants' accounts. Instead, we found a complex of expressions referring to a more momentary *Release*, relief, or opening, often suggesting more than a mere decrease of intensity (see below). Almost by definition, such *Release* would coincide with or indeed constitute a unit boundary. Finally, some sections of inner listening might be accompanied by feelings of *Expectancy* of forthcoming musical events or sought-after experiences (7 participants).

These concepts allow us an overview of the music-structural tendencies in the participants' inner listening experiences. In Figure 2, we see that the imagined musical structures rarely involved extended concatenations of units, but that there was nevertheless rather large variability within the briefer structures. First of all, even if dynamic units formed the majority, 36% of the participants failed to report any dynamic units at all. Given that our interview method was specifically geared toward highlighting experiential changes, this seems a rather reliable indication that some individuals may also experience imagined music in a rather static manner. Looping, in turn, was mentioned by 44% of the participants, but some of them mentioned it merely as something one "might do" at a given point. Further, for 40% of the participants, inner listening involved some

Looseness of structure, either in terms of Jumping to originally non-consecutive sections of the same piece or—for a small minority—even consciously improvising on the imagined piece or transitioning to *other* pieces of music. Finally, the figures for Change of intensity indicate the temporal extent covered by any experienced changes. More than half of the participants indicated some changes in the intensity of their experience, most often covering at least one whole structural unit.

#### STRUCTURAL EXAMPLES: PREPARED RELEASE

We will here use the notion of *Release* to demonstrate the qualitative nature of the mental musical structures disclosed in the analysis. *Release* is here understood as a momentary feeling of relaxation that is focalized by the experiencer so that it can be taken to define a section boundary. One of our participants described how the very beginning of his inner listening experience provided an immediate "relief" and "relaxation" where "feelings are awakened" and "emotional inhibition is opened up"—leading to a "soothing" state, felt as "a wave motion in the body" (male, 33 years). In all of the other 17 cases, however, such experiences occurred later, following a previous section that seemed to function as a preparation. In Figure 3, we present four analytical examples, annotated with spoken contents from the

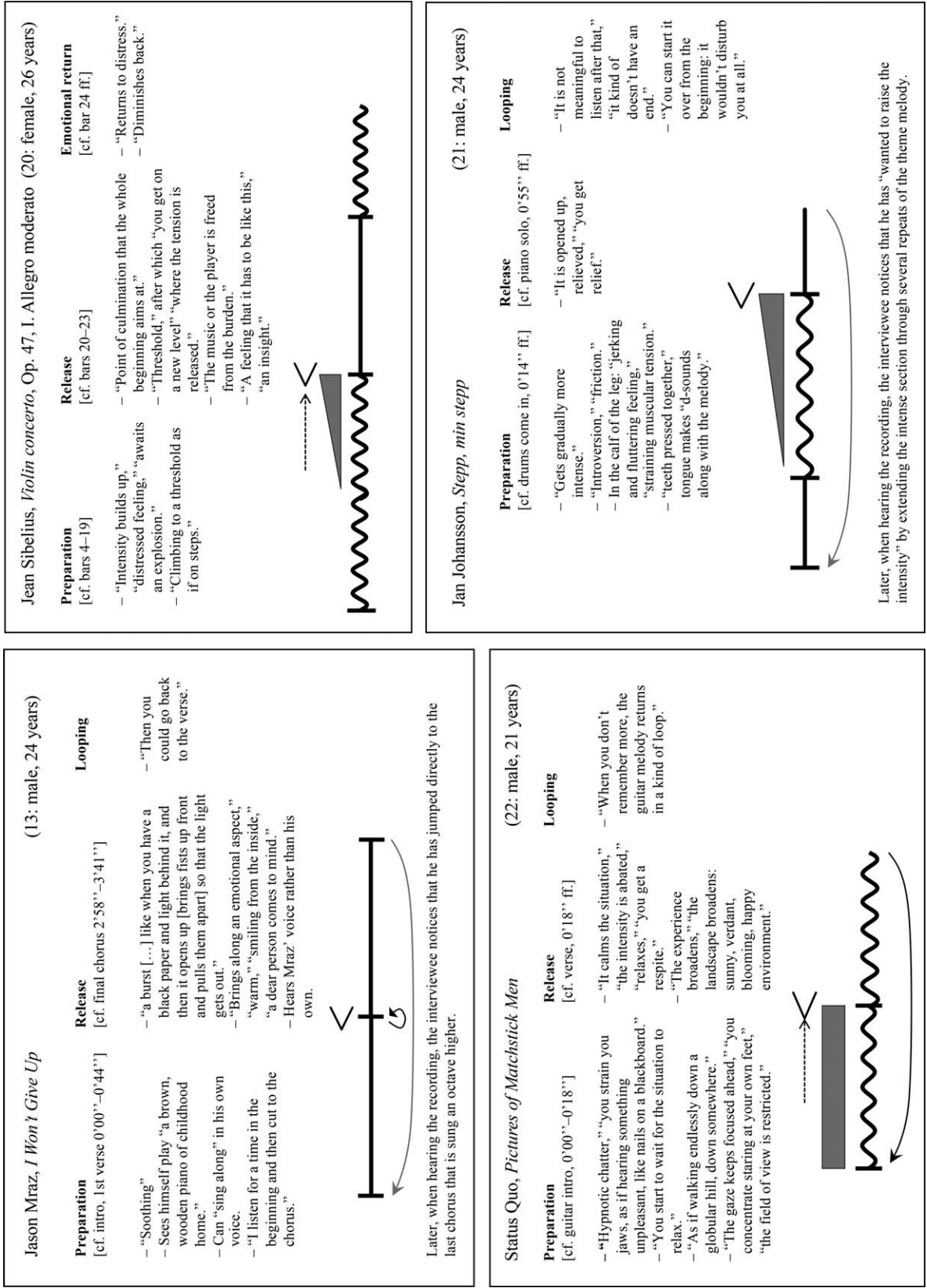


FIGURE 3. Structural positioning of Release (<) in internally listened music: combinations with Looping and Increase of intensity.

interviews. For convenience, we have added indexes referring to the original version, as identified during the closing discussion.

In the Jason Mraz song, the imaginer experienced the beginning of the chorus as akin to a burst of light, simultaneously transforming his perspective. Instead of hearing the original guitar accompaniment of the verse, he had first imagined himself playing his parents' piano, and heard himself singing. At the burst, these images shifted to hearing Mraz's singing and, most importantly for the experiencer, warmly imagining his own loved one. In the rest of the examples, the Release is intensified by a previous experience of intensity or tension: constant jarring intensity in the Status Quo piece (gray rectangle), or a gradual Increase of intensity in Jean Sibelius and Jan Johansson (gray wedge). Notice how such accounts might also involve expectation of the upcoming "broadening," "relief," or "point of culmination." We do not wish to overstate our findings, but certain experiences of intensity or tension and momentary Release did occur with striking similarities between a number of participants. For instance, five participants (not shown in the figure) described experiencing a weight in their chest that was subsequently relieved in a key moment during the experience.

After experiencing the Release, eight of the participants reported Looping back to the beginning of the sequence—thus, in effect, crafting a personalized, repeatable version of the piece to support the experience of intensity and release. In imagining the Swedish jazz pianist Jan Johansson's version of the well-known Soviet-Russian tune *Polyushko-polye* (*The Cossack Patrol*), participant 21 later noticed having added more repeats of the melody than were present in the recording (see Figure 3). In effect, this allowed him to let the bodily tension rise before resolving it in the beginning of the piano solo: While listening to the recording in the closing phase of the interview, he noticed that "in the original, the intensity does not rise as much."

#### MEANS OF VARIATION: OVERVIEW

The structural analyses allow us to assess the broader relevance of Aho's (2008) "means of variation in internal listening." With regard to Aho's notion of *Expansion*, where momentary sounds would be left sounding in the imagination, we found only a single testimony by a female singer (age 23) who, imagining a piece she was practicing with her choir, would "leave [a chord] sounding and keep listening to it." The rest of Aho's notions were more often attested, albeit with some differences in nuance. As seen above, *Preparation* for climactic moments occurred frequently, but the "climax" might

often not be a peak of intensity, but rather a feeling of Release that follows after it. *Looping* appeared in 22 of the experiences, although not nearly always continuing indefinitely as in Aho's account—perhaps because the interview context required "waking up" to a reporting mode. However, six of our interviewees did mention repeated Looping such as when a male student (age 25) re-enacted his imagining of a brief riff (of roughly 7 seconds, from Yes' *Siberian Khatru*), usually occurring as a continuous loop during his bicycle ride between home and university. Finally, both *Deletion* of subjectively irrelevant portions and *Combination* of originally separate parts of the music were obvious features of our participants' accounts, respectively implied by the relative brevity of the sectional structures and by the frequent consciously made jumps. Notice, however, that "deviation from the original" is not only a matter of sectional structure, but also relates to how the sections themselves may be qualitatively transformed in inner listening.

## Results II: Individual Differences of Content and Structure

#### DIMENSIONS OF CONTENT

To condense the content-related information concerning the "most evocative" interview sections, we subjected the expert panelists' ratings to principal component analysis. The goal was to locate the sources of evocativeness, as judged by panel 1, in other aspects of interview content, as judged by panels 2 and 3. Parallel analysis suggested three components to be extracted. Principal component analysis (with varimax rotation) yielded the loadings seen in Table 3 (loadings above 0.4 shown). The first of the components, here called *Relaxation* (PC1), separates the qualities of the interactive situation (as judged by Panel 3) from other variables. The second component could be called *Embodied evocativeness* (PC2), based on how it connects evocativeness (as judged by Panel 1) with bodily and kinaesthetic contents (as judged by Panel 2). Finally, the third component could be called *Object-directedness* (PC3), as it concentrates on less evocative contents related to objects, environments, agents, and autobiographical memories. The three components will be used below as content variables indicating three distinct dimensions of experiential content.

#### DIMENSIONS OF STRUCTURE

The results of the structural analysis were condensed into numeric variables called Number of units, Dynamic units, Looping, Looseness, and Change of intensity.

TABLE 3. Principal Component Analysis (with Varimax Rotation) of the Three Panels' Ratings

		PC1	PC2	PC3	Comm.
Panel 1: Distance to lived-through experience	Evocativeness		0.78		0.65
Panel 2: Contents of the description	Movements/dynamic forms		0.52		0.30
	Bodily experiences		0.70		0.63
	Images of agency			0.62	0.49
	Images of environments/object			0.82	0.68
	Autobiographical exp.		-0.46	0.60	0.58
Panel 3: Qualities of the interactive situation	Visible signs of inner listening	0.45			0.22
	Amusedness regarding experience	0.63			0.45
	Support by the interviewer	-0.41	0.45		0.38
	Relaxedness of the interaction	0.90			0.80
	Openness to own experiences	0.87			0.86
	Sum of squared loadings	2.418	1.949	1.683	
	Proportion of variance	0.220	0.177	0.153	
	Cumulative variance	0.220	0.397	0.550	

Each of these could receive either three or four values (between 0–2 or 0–3), according to the number of categories shown in Figure 2. To avoid potential overlap with the content variables in subsequent analysis of individual differences, we examined the Spearman correlations between the two sets of variables, finding a significant correlation between Dynamic units and Embodied evocativeness ( $\rho = 0.34$ ,  $p = .015$ ). While this corroborated our analytical interpretation concerning Dynamic units, the variable Dynamic units was thus shown to be partly redundant, and we shall leave it out of the following analysis, relying on the panelists for aspects of content.

#### INDIVIDUAL DIFFERENCES

For probing the dimensions of the S5 personality instrument, the OSIVQ cognitive style instrument, and various background variables as determinants of musical imagery, we inspected Spearman correlations between these individual characteristics, on the one hand, and the structural and content variables, on the other. All significant ( $p < .05$ ) correlations are summarized in Table 4.

Among the structural variables, Looping was strongly associated with the gender of the participants. While most (20) of the 26 female participants reported no Looping at all, and only a few of them mentioned it as a possibility (2) or mentioned it without qualification (4), the male participants were more often loopers. Among the 24 males, only 7 did not report Looping, while 9 mentioned it as a possibility and 8 reported it as such. Also, Looping somewhat decreased with age, but this may, in fact, reflect an effect of musical education: The years of formal musical education (as well as activities in classical music and teaching music) showed

TABLE 4. Significant Spearman Correlations Between Properties of Musical Imagery and Participants' Individual Characteristics

Properties of imagery	Individual characteristics	Spearman's $\rho$		
Structure	Looping	Gender	-0.43**	
		Age	-0.39**	
		Musical education	-0.31*	
	Looseness	Classical	-0.39**	
		Improvisation	0.28*	
		Teaching music	-0.36**	
		Neuroticism	0.31*	
Change of intensity	OSIVQ Spatial	-0.36*		
	Agreeableness	0.31*		
	Musical education	0.28*		
Content	Relaxation	Weekly listening	-0.29*	
		Neuroticism	-0.41**	
		OSIVQ Verbal	0.40**	
	Embodied evocativeness	Classical music activity	-0.30*	
		Object-directedness	Extraversion	0.33*
			Conscientiousness	0.38**
			OSIVQ Verbal	0.30*
Instruments	0.36**			
Teaching music	0.29*			

\*\* $p < .01$ , \* $p < .05$ ;  $p$  values computed using the asymptotic  $t$  approximation ( $df = 48$ ).

a negative association with Looping, too, but as all of our participants were music students, such effects cannot here be reliably disentangled from each other.

Looseness of imagined musical structure, in turn, showed a positive association with the personality trait of Neuroticism and a negative association with Spatial cognitive style. The latter effect suggests that

“holding musical structures together” in imagination could be supported by similar thought processes as are required in abstract spatial thought. Finally, Change of intensity was apparently diminished for the mass consumers of recorded music, but positively associated with musical education and with the personality trait of Agreeableness. The latter finding suggests an interesting potential connection between sensitivity to dynamic variability in music and empathic sensitivity to other people.

Turning to the content variables, it is notable that while both Embodied evocativeness and Object-directedness showed an association with Verbal cognitive style, they had otherwise rather different underpinnings. While Embodied evocativeness was apparently diminished in individuals active in classical music, Object-directedness was found to be positively associated with personality dimensions as well as, indeed, some “objectifying” sides of musical activity (playing a variety of instruments, teaching music).

In sum, our results suggest that the structure and content of mental listening may vary with individuals’ basic personal characteristics, personality, cognitive style, and their musical activities. Concerning personality, it may be noted that the only one of the Big Five dimensions not correlated with features of the imagery was Openness to Experience, which was constantly high, as might be expected in a group of artistically oriented individuals. For our music students, Openness scores had the highest mean (21.52) and smallest standard deviation (7.13) among the personality traits (for N, E, A, and C: means –6.80, 3.68, 18.44, 13.56; standard deviations 12.61, 11.24, 8.94, 10.04).

## Discussion

In this study, we have addressed the phenomenon of *pleasant musical imagery* (PMI)—the appreciated, desirable, or gratifying imagery of music in one’s mind. Unlike the concept of *involuntary musical imagery* (INMI), defined by involuntariness, or the related everyday notion of *earworms*, with its colloquial overtones of disturbance, and also unlike pedagogical notions such as *audiation*, emphasizing aspects of voluntariness, skill, and accuracy of the imagery, PMI is about *cherishing music in one’s mind*—about appreciatively embracing music as imagined. Beginning with Aho’s (2008) self-descriptive account of such private experiences, we assumed that similar experiences might be rather common, and set out to interview 50 music students on their PMI. Our study shows that Aho’s experiences were far from exceptional. None of our

participants indicated any problem with choosing a piece of music that they had “cherished” in their imagination, and most of them readily re-enacted such imagery in our interviews. Indeed, our interviews also support the notion of defining PMI without regard to (in)voluntariness. Testimonies of both involuntary receptivity and voluntary “putting the music on in one’s head” occurred in our material, but often the line between these seemed hard to draw. As our very first interviewee put it right after his first internal “listening” phase, “each time you hear it in your head, you immediately know that you have wanted to hear it in your head, but then again it is not a conscious choice” (male, 24 years).

Regarding the structural features of PMI, we found evidence for most of Aho’s “means of variation in internal listening.” Apart from frequent imaginative *Looping* of musical sections, we also found conscious divergencies from the “original” piece. While Aho’s terms—*Deletion* of subjectively irrelevant parts and *Combination* of originally separate parts—appear to signal an objectifying, combinatory stance toward the emerging musical structures, our participants rather tended to indicate the local acts of *Jumping* to another section. Also, while Aho’s terms indicate *de facto* divergencies from the original, in our material any such *Looseness* of structure only covered cases that the participant was aware of before comparing with the original. Finally, we also found frequent instances of what Aho called *Preparation* before climactic moments. In our analysis, such passages of increasing intensity lead to moments of *Release*, relief, or opening, sometimes combined with subsequent *Looping* of the whole sequence. Such means of variation often seem to serve the purpose of heightening the pleasurable aspects of musical experience. For instance, to the extent that musical repetition “encourages a sort of embodiment of the sound [. . .] that is by its very nature pleasurable” (Margulis, 2014, p. 25), a looped sequence of gratifying, dynamic trajectories of *Preparation* and *Release* would seem to optimize the prospects of experiencing pleasure by means of musical imagery.

Possible associations of such structural phenomena and personal characteristics were then analyzed with Spearman correlations. Here, *Looping* was strongly associated with being male. It appeared that many of our male participants were fond of imagining shorter riffs or other briefer patterns, whereas female participants seem to have approached the music from more “narrative” perspectives. *Looping* also decreased with age, which might be explained by a preference of younger cohorts for repetitive popular music that is characterized by shorter repetitive motifs. However, our

participants were music students, and it is also conceivable that continuing musical education supports imagery skills required for longer, less repetitive imaginary concatenations.

Looseness of imagined musical structure was associated with Neuroticism. This may seem to contrast with the study of Wammes and Barušs (2009), in which the tendency to imagine songs in their entirety correlated negatively with Independence (which is tantamount to a positive correlation with Neuroticism). Note, however, that we have not relied on our participants' sweeping generalizations concerning whether they actually imagine songs in their entirety or not. Making such "entirety claims" might well be associated with Neuroticism, but in light of our study it appears somewhat questionable to what extent people would actually ever imagine songs in their entirety. In our study, structural features such as Looseness emerged from actual sequences of imagery, and our results simply indicate an association between Neuroticism and the tendency to consciously deviate from the original piece. We might speculate that it is a certain Impulsivity, as a sub-dimension of Neuroticism, that here becomes manifested in the imaginary activity. Finally, Looseness also correlated with the lack of Spatial cognitive tendency, pointing to an association of Spatial cognitive style with the inclination to "hold imagined musical structures together." Hence, while PMI may be nominally unrestricted by requirements for accuracy or correctness, it seems that individual differences of this kind may be associated with individually developed styles of musical imagery varying in their structural rigidity.

In terms of the experiential content involved in PMI, we selected what appeared the "most evocative" segments of the interviews, subjecting these to ratings by trained panelists. A principal component analysis of the ratings yielded three components. Apart from a situational *Relaxation* component, the two other components were related to the content of the experiences, suggesting separate dimensions for *Embodied evocativeness* and for non-evocative *Object-directedness* of described content. The central result here is that evocativeness was closely tied to bodily and kinaesthetic images while object-directed imagery did not show such a connection. The contents of the PMI sequences thus varied in two distinct dimensions: an "inner" dynamic and embodied one—indicating lived-through experience—and an "outer" one, reflecting associative contents that might or might not be evocatively mediated.

Regarding these content variables, a notable finding was that especially *Embodied evocativeness* was strongly correlated with Verbal cognitive style. The resulting picture of evocativeness is thus twofold. The interpretive,

empathetic understanding of evocativeness implicit in our panelists' ratings was not only anchored in embodiment, but it was also strongly associated with the interviewees' verbal cognitive style ratings. Taken at face value, this suggests that observers' interpretation of evocativeness may closely correspond with individuals' verbal skills in mediating the embodied nature of their inner experiences. This would be in line with the suggestion that sensations arising within the body can only be effectively externalized by means of verbal, metaphorical means (Nagornaya, 2013).

The other content dimension, *Object-directedness*—indicating imagery of agency, objects, environments, and autobiographical events—was in turn associated with Conscientiousness, but also with Extraversion. Outside of musical contexts, previous studies have been inconclusive in terms of whether vividness of imagery is associated with introverts (Huckabee, 1974; Strelow & Davidson, 2002) or extraverts (McDougall & Pfeifer, 2012). With the caveat that our results do not directly concern self-reported vividness but rather contents appearing in the interviews, our results nevertheless suggest that both Conscientiousness and Extraversion would be conducive to a more factual, and less embodied or evocative kind of imagery. Finally, we found that *Relaxation*—the content dimension having to do with the interview situation—was negatively correlated with Neuroticism. This is understandable, given that Neuroticism has been found to predict coping strategies such as withdrawal and support seeking (Connor-Smith & Flachsbart, 2007), which might be detected in interview situations by empathetic observers.

The question concerning the significance of PMI in people's lives (e.g., Lipson, 2006) falls beyond the scope of this article. It may be noted, however, that our analytical examples concerning sequences of Preparation and Release are reminiscent of DeNora's (2000, p. 24) notion of "musical forms as devices for the organization of experience," in what she calls *human-music interaction*. It is not far fetched to argue that the significance of PMI in everyday life might actually be grounded in the possibility of using imagined music as a ubiquitous "device" of embodied music interaction that one can carry around and interact with anytime and anywhere (even in a seemingly "involuntary" manner). At least to an extent, people might purposefully use PMI in regulating or modulating their experiences to be more engaging, enjoyable, or gratifying. Hence the interactional usage of PMI might be related to previous accounts concerning music in affect regulation, self-enhancement, and the construction of self-identity (e.g., Baltazar & Saarikallio, 2016; DeNora, 2000; Elvers,

2016; Saarikallio & Erkkilä, 2007; Schäfer, 2016; Schäfer & Sedlmeier, 2009).

In our study, we applied the elicitation interview method (Petitmengin, 2006; Vermersch, 1999) to study participants' first-person PMI experiences in the second person. The method has been designed to systematically provide the interviewee with interactive guidance in focusing on, evoking, and describing detailed aspects of particular experiences. For our purposes, it provided an appropriate way of "eliciting" specific experiences of musical imagery into the present moment, to be studied in a freshly-lived and immanent manner, instead of relying on memories and constructed self-representations of how a person "usually" imagines music. Epistemologically speaking, we found it essential to instruct interviewees to focus on what is present instead of going back to some previous moment (cf. Schäfer et al., 2014). In our approach, the emphasis is not on episodic memory as a "videotape recording" which one could "rewind" back to the past moment. Even in cases of re-living a past moment (e.g., the moment of imagining a looped riff while bicycling to the university), the evoked experience legitimately unfolds and is accessible in the present.

Instead of the accurate recollection of past experiences, our approach thus emphasizes accuracy and detail related to how experiences of PMI unfold. Focusing on the *processes* of enacted imaginary sequences differentiates this method from other interview methods that, despite their aim to describe the phenomenology of imagery, might lead the participants to provide more abstract generalizations, conditional statements,

or explanations based on memories from previous occasions (e.g., Williamson & Jilka, 2013). Given our focus on the imagery processes themselves, the elicitation interview method, accompanied with peer judgments, aspires to the function of a validation procedure (see Petitmengin, 2006; Petitmengin & Bitbol, 2009). It provides some measure of empirical security that the results will not just reflect peoples' inaccurate memories of previous experiences, their snap judgments concerning how they believe they might "usually" imagine music, or their theoretical reconstructions of such experiences, but that the research will actually trace participants' "micro-practices" of "doing things with music" (see Krueger, 2011). In sum, our method suggests one way of bridging the first person's lived experiences, through making them explicit and validating them in the second-person mode, to descriptions injectable into a third-person scientific framework. In proposing this as a new paradigm for studying musical imagery, we urge our fellow researchers to pay attention to those interactional and enactive processes of inner listening that make everyday musical imagery something much more than just an involuntary cognitive intrusion.

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## Appendix. The Questionnaires Used for the Evaluation of the “Most Evocative Sections” of the Interviews

Panel 1	Panel 2	Panel 3
<b>Distance to lived-through experience</b>	<b>Contents of the description of the experience</b>	<b>Qualities of the interactive situation</b>
Which of the four positions was most central for understanding the experience:	In the descriptions provided by the interviewee, are there references to:	Rate the interview situation for the following aspects:
<b>An evocative position [3]</b> – The person describes a particularized, lived-through experience in a tangible and animated manner, concretizing lived presence in the moment.	– movements or dynamic forms, – bodily experiences, – images of agency, – images of an environment and/or of objects, – autobiographical experiences. <sup>1</sup>	– visible signs of inner “listening” (turning toward inner experience) [no signs vs. clearly visible], – amusedness of the interviewee at speaking about the experience [no signs vs. clearly visible], – support by the interviewer in examining the experience [very little vs. very strong], – relaxedness of the interaction [tense vs. relaxed], – openness of the interviewee to own experiences (including new findings and surprises) [self-controlled vs. open]. <sup>2</sup>
<b>A semi-evocative position [2]</b> – The person describes a particularized, lived-through experience, but in a more distant and conceptual manner than above.		
<b>A particularized abstract position [1]</b> – The person describes a particularized experience, but detached from lived experience, relying on vague memory traces, learned schemata or interpretations.		
<b>A generalizing abstract position [0]</b> – The person generalizes the experience, or explains it theoretically. – Is detached both from lived experience and from particular experience.	<sup>1</sup> In each case, a four-point scale was used: “no” = 0, “maybe” = 1, “yes” = 2, “centrally” = 3.	<sup>2</sup> In each case, a four-point scale was used between the two opposing alternatives given.