CREATING, PRACTICING, AND REACTING TO MUSIC: A CONTENT ANALYSIS OF RESEARCH

Psychology of music, a science of the relations between humans and sound structures, is continuously developing. Given the growing number of publications in this domain, reviews of the literature are of value, as they integrate knowledge, informing and guiding future research endeavors. This article presents the results of a 47-year (1973–2019) content analysis of research on creating, practicing, and responding to music featured in The Psychology of Music journal. The purpose of our study was to identify and describe the themes in research on creating, practicing, and responding to music, indicating which study topics were the most often present in publications. We identified 17 categories of research topics and found that the largest number of publications dealt with predictors of music creating, self-regulated practice, or affective responses to music. Suggestions for developing and bolstering research and practice are provided.

Keywords: creating music; musical practice; reactions to music; literature review; content analysis; psychology of music.

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Funding Source: This research was financed by the National Science Centre, Poland, grant no. DEC-2018/29/N/HS6/02641.

We thank Prof. Mariola Laguna (The John Paul Catholic University of Lublin) for her comments that helped us improve this paper and for her support in editing this issue.
INTRODUCTION

Music appears when the construction of sounds is created and recognized with pleasure (Rakowski, 2001). Among many disciplines dealing with sound structure, such as music education or music theory and analysis (Ockelford, 2016), psychology of music is a science about humans as music creators (Hart & Di Blasi, 2013; Kozbelt, 2007), performers (Barry, 1992; Miksza, 2013), and listeners (Rickard, 2004; Bennett & Ginsborg, 2018) and about the two-way relations between them and music (Manturzewska, 1990).

Being a distinct discipline, psychology of music is at the same time a highly integrative and multidisciplinary field (Ockelford, 2016). This is reflected in the aims of one of the key journals devoted to this area, namely Psychology of Music (PoM). This journal seeks to “increase the scientific understanding of all psychological aspects of music and music education” and to publish “studies on listening, performing, creating, memorizing, analyzing, learning and teaching as well as applied social, developmental, attitudinal and therapeutic studies” (PoM, 2019).

In this article we decided to focus only on three research areas and describe their contents. The purpose of our study was to identify and describe the themes in present in the studies on creating, practicing, and responding to music published in PoM. We aimed to answer following research questions: (1) What are the topics of studies on creating, practicing, and responding to music published in the PoM journal? (2) Which study topics were published the most often in PoM? (3) What are the major aims of studies addressing each topic?

In order to answer research questions, we first briefly outline the issues involved in creating, practicing, and responding to music. Next, we present an analysis of PoM literature. As this is an introductory paper to the special issue of Annals of Psychology (AoP) on musical creation, music practice, and reactions to music, in the Conclusions section we outline the contents of papers included in this issue.

1 In this article we use the terms “psychology of music” and “music psychology” interchangeably.

2 We chose PoM because it is currently the most prestigious journal in the field of music psychology, with the highest impact factor (IF = 1.38) compared to other journals, such as Music Education Research (IF = 0.83), Musicae Scientiae (IF = 1.25), or Music Perception (IF = 1.15).
Creating, Practicing, and Responding to Music

One of the areas of research devoted to the understanding of music and human relationship is the process of engaging in music creative activities. In psychology, creativity is viewed as “the generation of ideas, insights, or problem solutions that are both novel and potentially useful” (Baas, De Dreu, & Nijstad, 2008, p. 780). Creative musical activities include spontaneous behaviors, composition, and improvisation (Ryan & Brown, 2012). Musicians may, for example, perform a familiar piece in a new expressive way, which makes it sound spontaneous (Keller, Weber, & Engel, 2011), they may compose—with pen and paper, using revision and hard work to eliminate or avoid mistakes, and they may also improvise, that is, perform newly created music in “real time” (Larson, 2005). Musical composition and improvisation can be performed individually or with a group of people (e.g., during jam sessions; Wilson & MacDonald, 2012).

Psychology also offers musicians some points of reference in their everyday activities such as their home practice, which consists in physically and/or mentally repeated musical performance (Mielke, 2016). Researchers distinguish formal (deliberate) practice—that is, effortful, focused on improvement of musical skills—and informal practice, which is a playful activity, without an explicit aim to improve (Ericsson, Krampe, & Tesch-Roemer, 1993; Sloboda, Davidson, Howe, & Moore, 1996). Self-regulated learning (SRL) is a process in which students actively strive to acquire academic skills (Zimmerman, 2002), also in the domain of music; it requires using metacognitive strategies (e.g., goal setting, planning) and task-specific cognitive strategies (e.g., slow repetition) as well as management strategies (e.g., avoiding distractions) to attain goals (Bonneville-Roussy & Bouffard, 2015). Management strategies are an essential feature of metaknowledge and metacognitive self (Lawendowski, Kierzkowski, & Karasiewicz, 2016).

Music psychology is also interested in people’s reactions or responses to sound structures. Music can influence human functioning in multiple ways, impacting affect, thoughts and evaluations, body movement and physiological reactions (Schäfer, Sendlmeier, Städtler, & Huron, 2013). In psychology, affect is understood as consciously accessible feelings that include long-lasting moods (e.g., cheerfulness, depression) and emotions (e.g., happiness, anger; Baas et al., 2008; Fredrickson, 2001). Musical affect can also include aesthetic judgments (Juslin, 2016). Whether music evokes genuine emotional responses in listeners or whether listeners merely perceive the emotions expressed by the music is an
important issue in studies on music and emotion (Lundqvist, Carlsson, Hilmersson, & Juslin, 2008).

METHOD

In our content analysis we examined the topics present in research on creating, practicing, and responding to music published in PoM from the inception of the journal until November 2019. The year of publication did not limit the search. We included studies with participants of both genders, of non-specific ethnicity, in all ages and involved all forms of music-based research. We used the SAGE database search engine to find studies of interest. Our search strategy is presented in Table 1. The terms used to find the studies were entered in four separate searches.

Table 1. Search Strategy Employed in Content Analysis

<table>
<thead>
<tr>
<th>Search terms</th>
<th>Search field descriptor</th>
<th>Filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>musical composition</td>
<td>All</td>
<td>research article</td>
</tr>
<tr>
<td>practice</td>
<td>Title</td>
<td>research article</td>
</tr>
<tr>
<td>reactions AND music</td>
<td>Title</td>
<td>research article</td>
</tr>
<tr>
<td>responses AND music</td>
<td>Title</td>
<td>research article</td>
</tr>
</tbody>
</table>

We found 531 article titles and abstracts, and screened them for eligibility for inclusion in this review, deciding whether they concerned topics of interest or not (Figure 1). After the selection process, we retained 98 articles that elaborated on one of the topic of interest: creating, practicing, or responding to music (one article elaborated on two topics—creating and practicing; Love & Barrett, 2018).

Next, we developed a codebook that covered specific topics studied in conjunction with music creating, practicing, and responding to music. The remaining 98 articles were coded by these topics. Written descriptions of study aims were taken from abstracts of articles, except the study aim from one article which was obtained as a full text (as it did not have an abstract), in the case of two studies, descriptions were based on titles, due to the unavailability of abstracts or full text of these publications.
RESULTS

Topics of Studies on Creating, Practicing, and Responding to Music

The first question was: “What are the topics of studies on creating, practicing, and responding to music published in PoM?” Based on our analysis of the journal’s contents, we identified 17 topic areas, including six topics for creativity research, seven for practice research, and four for research on responses to music (Table 2).
Table 2. Content Analysis Codebook

<table>
<thead>
<tr>
<th>Research area</th>
<th>Topic code and discourse</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Music creating</td>
<td>PMC – Predictors of musical creativity</td>
<td>These articles include research on factors that influence or correlate with musical creativity.</td>
</tr>
<tr>
<td></td>
<td>UPMC – Understanding the process of music creation</td>
<td>These articles include research on people’s behaviors, reactions and thoughts during the music creation process.</td>
</tr>
<tr>
<td></td>
<td>UMC – Utility of musical creativity</td>
<td>These articles include research presenting the role of music creativity and the ways in which it can be profitable for people.</td>
</tr>
<tr>
<td></td>
<td>TLMC – Teaching and learning musical composition</td>
<td>These articles include research on the nature of teaching and learning beliefs, processes and practices and on the nature of interactions between a composer-teacher and a student-composer.</td>
</tr>
<tr>
<td></td>
<td>CMC – Collaborative musical creativity</td>
<td>These articles include research on collaborative musical creativity and composition, for example during jam sessions.</td>
</tr>
<tr>
<td></td>
<td>EMC – Evaluation of musical creativity</td>
<td>These articles include research on the evaluation of the results of musical creativity, for example assessments of the originality or quality of compositions.</td>
</tr>
<tr>
<td>Musical practice</td>
<td>DDP – Demographic determinants of practice</td>
<td>These articles include research exploring how different groups of musicians, such as jazz or classical musicians, males or females, differ in their musical practice.</td>
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<tr>
<td></td>
<td>SRL – Self-regulated music learning</td>
<td>These articles include research on self-regulated learning in musical practice.</td>
</tr>
<tr>
<td></td>
<td>SDG – Self-determination and goals in musical practice</td>
<td>These articles include research applying self-determination theory or goal concept in the context of musical practice.</td>
</tr>
<tr>
<td></td>
<td>OFP – Other factors related to practice</td>
<td>These articles include research on factors influencing musical practice that did not fit into the DDP, SRL, or SDG categories.</td>
</tr>
<tr>
<td></td>
<td>PIC – Practicing improvisation and composition</td>
<td>These articles include research on practice aimed at acquiring skills in improvisation and composition.</td>
</tr>
<tr>
<td></td>
<td>PAP – Practicing absolute pitch</td>
<td>These articles include research on practice aimed at the development of absolute pitch.</td>
</tr>
<tr>
<td></td>
<td>EMP – Effects of musical practice</td>
<td>These articles include research on the effects of musical practice in terms of improvement in musical achievement.</td>
</tr>
<tr>
<td>Responses to music</td>
<td>ARM – Affective responses to music</td>
<td>These articles include research on affective responses to music listening.</td>
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<tr>
<td></td>
<td>BRM – Bodily responses to music</td>
<td>These articles include research on bodily responses to music.</td>
</tr>
<tr>
<td></td>
<td>PRM – Perceptual responses to music</td>
<td>These articles include research on participants’ ability to describe the properties of music, i.e., to identify the musical structure, and their awareness of details in music.</td>
</tr>
<tr>
<td></td>
<td>ORM – Other responses to music</td>
<td>These articles include research on other types of responses to music.</td>
</tr>
</tbody>
</table>
The second question was: “Which study topics were published the most often in PoM?” Some articles related to more than one category, rendering totals higher than 98. The majority of studies on musical creativity concerned PMC (Tables 2 and 3). Out of seven categories in practice research, studies on SRL and EMP were in the majority. Research on responses to music mainly explored the topics of ARM and BRM.

Table 3. Frequency and Percentage of Topics in Studies on Creating, Practicing, and Responding to Music Published in PoM

<table>
<thead>
<tr>
<th>Area of research</th>
<th>Topics</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Music creating</td>
<td>Predictors of musical creativity</td>
<td>9</td>
<td>25.00</td>
</tr>
<tr>
<td></td>
<td>Understanding the process of music making</td>
<td>6</td>
<td>16.67</td>
</tr>
<tr>
<td></td>
<td>Utility of musical creativity</td>
<td>5</td>
<td>13.89</td>
</tr>
<tr>
<td></td>
<td>Teaching and learning musical composition</td>
<td>4</td>
<td>11.11</td>
</tr>
<tr>
<td></td>
<td>Collaborative creativity</td>
<td>6</td>
<td>16.67</td>
</tr>
<tr>
<td></td>
<td>Evaluation of musical creativity</td>
<td>6</td>
<td>16.67</td>
</tr>
<tr>
<td>Musical practice</td>
<td>Demographic determinants of practice</td>
<td>5</td>
<td>12.20</td>
</tr>
<tr>
<td></td>
<td>Self-regulated music learning</td>
<td>11</td>
<td>26.83</td>
</tr>
<tr>
<td></td>
<td>Self-determination and goals in musical practice</td>
<td>6</td>
<td>14.63</td>
</tr>
<tr>
<td></td>
<td>Other factors influencing practice</td>
<td>4</td>
<td>9.76</td>
</tr>
<tr>
<td></td>
<td>Practicing improvisation and composition</td>
<td>3</td>
<td>7.32</td>
</tr>
<tr>
<td></td>
<td>Practicing absolute pitch</td>
<td>2</td>
<td>4.88</td>
</tr>
<tr>
<td></td>
<td>Effects of musical practice</td>
<td>10</td>
<td>24.39</td>
</tr>
<tr>
<td>Responses to music</td>
<td>Affective responses</td>
<td>23</td>
<td>53.49</td>
</tr>
<tr>
<td></td>
<td>Bodily responses</td>
<td>10</td>
<td>23.26</td>
</tr>
<tr>
<td></td>
<td>Perceptual responses</td>
<td>8</td>
<td>18.60</td>
</tr>
<tr>
<td></td>
<td>Other responses</td>
<td>2</td>
<td>4.65</td>
</tr>
</tbody>
</table>

The third question was: “What are the major aims of studies addressing each topic?” In the following sections we describe the aims of studies on creativity, practice, and responses to music that were included in this analysis.
Nine studies on the PMC aimed to explain musical creativity or music making by studying factors that could influence them. Mawang, Kigen, andMutweleli (2018) studied the relationships between goal achievement motivation, cognitive learning strategies, and musical creativity. MaIntyre and Potter (2013) tested motivational differences (i.e., musical self-esteem, effort, desire to learn, willingness to play, and possible musical selves) between those who wrote music, those who planned to write music in the future, and those who did not write nor intend to write music. Another study (MacDonald, Byrne, & Carlton, 2016) explored the relation between self-assessed creativity, flow (i.e., optimal experience from Csikszentmihalyi’s theory), and the quality of the compositions.

Beyond motivational variables, researchers (Sovansky, Wieth, Francis & McIlhagga, 2014) also investigated how the level of music expertise and engagement in music creation were related to increased creativity. Similarly, Seddon and O’Neill (2001, 2006) studied the role of composers’ experience of formal instrumental music tuition in the quality of compositions, while Colley, Banton, Down, and Pither (1992) compared the strategies employed in expert and novice performances of composition task.

Some behaviors can also have an impact on music making. Eskine, Anderson, Sullivan, and Golob (2018) examined whether the effect of music listening on semantic memory and/or mood are mechanisms responsible for creativity. Hill, Hill, and Walsh (2017) studied the impact of task-based and interpersonal conflicts between band members on the creation of collaborative compositions.

Six studies concerning UPMC presented the characteristics of the music making process, exploring people’s behaviors, reactions, and thoughts during creation. For example, Collins (2005) mapped cognitive processes during the compositional process tracked in real time. Burnard (1999) focused on children’s kinesthetic memory in improvisation and composition tasks, while Dean and Bailes (2015) explored skin conductance in musicians during piano improvisation. Investigating flow (MacDonald et al., 2016) or verbal and nonverbal interactions (Hill et al., 2017) during the composition process constituted other aims of research on UPMC. Lastly, Williams et al. (2014) reviewed studies implementing systems for algorithmic composition with the intention of targeting specific emotional responses in the listener.

Five studies on UMC show how musical creativity can be profitable for people; for example it can be used for psychotherapeutic purposes. Allen (2013) examined the effectiveness of free improvisation as a treatment for the reduction

Four studies addressed the topic of TLMC. Barrett (2006) investigated the teaching and learning beliefs, processes, and practices of a composer-teacher when working with a student-composer over the course of one academic semester. Barrett and Gromko (2007) videotaped formal interactions between a composer-teacher and a student-composer and interviewed them individually. Love and Barrett (2015, 2018) examined practices and structures evidenced through a composers’ workshop via observation of rehearsals, masterclasses, and interviews with students, teachers, and a conductor.

Six studies investigated CMC. Hart and Di Blasi (2013) explored the subjective experience of combined flow in musical jam sessions. Flow experience during the group compositional process was also examined in the study by MacDonald et al. (2016). Another, previously mentioned, study showed the impact of interpersonal conflicts on collaborative compositions (Hill et al., 2017). Wilson and MacDonald (2012) compared interview data collected from jazz musicians’ and free improvisers’ from varied backgrounds, exploring the differences in the way group improvisation was constructed. Hass, Weisberg, and Choi (2010) aimed to examine the career development of collaborative songwriting teams. Finally, Sawyer (2006) presented three defining characteristics of group creativity: improvisation, collaboration, and emergence, presenting several examples of group creativity in both music and theater.

Six studies focused on EMC. Kozbelt (2007) presented an analysis of Ludwig van Beethoven self-critical statements about his compositions, found in his letters and conversations. Another example is the study by MacDonald et al. (2016) in which compositions completed by participants were recorded and rated for quality and creativity by the participants and by a group of music education specialists. In a different study (Priest, 2006) the relation between self-assessment of students’ compositions and independent judges’ assessments was investigated. Seddon and O’Neill evaluated computer-based compositions prepared by children (2001) and adolescents (2006). Evaluations were made by music specialist and nonspecialist teachers, the children themselves, and experts.
Lastly, Simonton (1994) described the computerized content analysis of musical structure, which enabled the assessment of a composition’s originality.

To sum up, studies on PMC mostly focused on the level of musical experience as a predictor \((n = 4)\), motivational variables were the second studied type of predictors \((n = 3)\), and single studies investigated the influence of music listening or conflicts among composers on musical creativity. Among studies concerning UPMC, single studies explored skin conductance, kinesthetic memory, cognitive processes, flow, or social interaction during music creating. UMC research explored the usefulness of music creativity in therapy \((n = 2)\) and in enhancing the psychological functioning of children \((n = 1)\) and adults \((n = 1)\), and presented the link between creativity and musical experience \((n = 1)\). TLMC studies investigated the processes taking place during a composition course \((n = 2)\) or compositional workshop \((n = 2)\). Studies on CMC referred to flow \((n = 2)\), and single studies investigated communication, career development, the role of musical genre background, or the definitions of terms related to collaborative creativity. Studies on EMC mostly concerned human assessment \((n = 5)\); one study evaluated computer evaluations of compositions.

**Research on Practice**

There were five studies on DDP. Hallam et al. (2016) studied gender differences in the amount of practice, practice strategies, and motivation among children and adolescents. Hallam et al. also investigated how the level of musicians’ expertise (2012) or the instrument played (Hallam, Creech, Varvarigou, & Papageorgi, 2019) influenced the strategies and motivation to practice. Sandgren (2018) focused on the differences in instrumental practice across musicians representing various musical genres (jazz, folk music, classical) and vocalists in relation to instrumentalists. Lastly, Austin and Berg (2006) compared band and orchestra students’ practice motivation, frequency of practice, amount of practice, and practice regulation.

ly, Miksza (2013) verified the effect of SRL instruction on wind players’ performance achievement, practice behavior, and self-efficacy. Bonneville-Roussy and Bouffard (2015) aimed to test an integrative framework in which self-regulation, deliberate practice strategies, and practice time were simultaneously taken into account in the prediction of musical achievement. Boucher, Creech and Dubé (2019) focused on one specific SRL strategy, namely video feedback, and analyzed its influence on the self-evaluation of guitarists while practicing a new piece of music.

Six studies on SDG used either self-determination theory or goal concept in exploring practice. Evans and Bonneville-Roussy (2016) investigated whether needs fulfilment and autonomous motivation of university music students explained context-specific affect and practice behavior. A different study investigated the influence of autonomy and competence needs satisfaction on flow experience in instrumental practice (Valenzuela, Codina, & Pestana, 2017). Schatt (2017) examined factors influencing self-determination for practice and validated an instrument to measure self-determination in practice. Chaffin and Imreh (2001) focused on the goals of expert practice and how they changed across the learning process. In another study (Smith, 2005), the author examined how goal orientation and implicit theory of ability were related to practice behavior, and evaluated the adaptation of measures of academic motivation to the musical domain. Similarly, Miksza (2010) studied the relationships between achievement goal motivation, music performance, impulsivity, and music practice.

Four studies concerned OFP. Barry and McArthur (1994) evaluated an inventory designed to assess the extent to which studio music teachers taught certain practice strategies. Ginsborg, Chaffin, and Nicholson (2006) reported a content analysis of musicians’ (a singer and pianist/conductor’s) verbal commentaries made in individual practice sessions and their discussions during joint rehearsals. The third study summarized the literature concerning the relationship between affect and instrumental practice (Mazur & Laguna, 2019). The fourth study tested whether perceptual learning style theory applied to the learning of musical material (Odendaal, 2015).

There were three studies on PIC. Kanellopoulos (1999) investigated children’s idea of musical improvisation in their practice of spontaneous music making, using an ethnographic, open-ended process of gathering data. Johansen (2017) analyzed empirical data from a qualitative study on jazz students’ instrumental practice and discussed approaches to instrumental practice that served the purpose of developing improvisation competence. Love and Barrett (2018)
studied how music composition students acquired their skills during practice in a workshop with composition teachers.

Two studies focused on PAP. Crozier (1997) aimed to verify whether there was a critical period in the development of absolute pitch and whether the same techniques for acquiring absolute pitch were more effective with immature compared to mature individuals. Sakakibara (2012) performed a longitudinal study to investigate the process of acquiring absolute pitch in young children.

We found ten studies that measured EMP. Four previously mentioned studies (Bonneville-Roussy, & Bouffard, 2015; Boucher et al., 2019; Miksza, 2010, 2013) investigated the links between SRL and performance achievement. Also, Allen (2012) studied procedural memory consolidation effects on performance. Barry (1992) assessed the effects of field-dependence/independence and gender upon the technical accuracy and musicality of student instrumental performance under both structured and free practice conditions. Evans and McPherson (2014) report on their longitudinal study of children’s musical identity, their instrumental practice, and subsequent achievement and motivation for playing music. Hallam, Papageorgi, Varvarigou, and Creech (2018) examined how self-reported instrumental practice and motivation to learn were related to instrumental examination outcomes. Rosemann, Altenmüller, and Fahle (2015) investigated the impact of practice, playing tempo and the complexity of the music on the size of the eye-hand span (the distance between eye – fixation of note, and hand position – tapping the corresponding key), and its relation to the quality of performance after practice. The last study examined the effects of cognitive load during practice on the effects of university wind students’ learning (Stambaugh, 2012).

To sum up, single studies on DDP presented the role of gender, musical expertise, instrument played, musical genre or type of musical training in instrumental practice. Single studies on OFP investigated teaching strategies, learning style, affect, or communication in the context of instrumental learning. Studies on SRL concerned measurement tools (n = 4) and investigated practice strategies used by musicians (n = 3) or the link between practice behaviors and self-efficacy and/or the effects of practice (n = 4). Research on SDG referred to the theory of self-determination (n = 3) or to the concept of goal (n = 3). Studies on other types of practice (PIC and PAP) focused on learning improvisation (n = 2), composition (n = 1), or absolute pitch (n = 2). Lastly, EMP studies linked SRL with musical achievements (n = 4) and considered tempo or cognitive load during practice (n = 2); single studies presented the effects of memory consolidation, motivation, gender, and field-dependence on children’s musical identity.
Research on Responses to Music

Twenty three studies explored ARM. Four of them described measurement tools for the investigation of affective reactions (Asmus, 1985; De Vries, 1991; Sandstrom & Russo, 2011; Yinger & Springer, 2018). Music may arouse various emotions in listeners, and 14 studies were devoted to the circumstances that contribute to such affective reactions. Krahé, Hahn, and Whitney (2015) explored which channel of information—visual (body movements) or auditory (musical material)—determined the emotions perceived and felt in response to music performance. In a similar way, Gfeller, Asmus, and Eckert (1991) compared the effects of musical and textual settings (text alone, commercial-type background music, commercial-type background music with text, atonal music, atonal music with text) on the listeners’ affective response and mood.

People’s emotional responses can also depend on the music they listen to. Imbir and Gołąb (2017) assessed the affective connotations of musical excerpts covering both modern musical genres and classical music. Daynes (2010) focused on the role of the familiarity and the tonal or atonal character of music in predicting the emotional reactions experienced by listeners. Holbrook and Anand (1990) investigated the effects of tempo and situational arousal on the listeners’ perceptual and affective responses to music. Sloboda (1991) explored which features of musical structure (e.g., passages containing sequences) was responsible for the occurrence of a range of physical reactions while listening to music (e.g., laughter, tears). Saiz-Clar and Reales (2017) developed a composite neural network that predicted activation and emotional valence from a set of temporal and tonal properties of the stimuli (e.g., rhythm, tempo) and classified the stimuli into four emotional categories (calm, happiness, fear, and sadness). Luck et al. (2007) explored the relationships between musical features relating to various aspects of music therapy improvisations (e.g., timing, dynamics, tonality) and participants’ emotion ratings of that music.

Affective responses to music can be culture-specific. Gregory and Varney (1996) presented cross-cultural comparisons between European and Asian subjects in affective response to a variety of excerpts of Western classical, Indian classical, and New Age music. Cultural aspect of affective responses was also explored in the study by Susino and Schubert (2018). They verified whether emotional responses to a music genre could be predicted by the stereotypes of the culture that the music genre was associated with.

Not only the features of music and the environment, but also the features and decisions of the people who listen to music can impact their emotional reactions.
to sound stimuli. In their experimental study, Liljeström, Juslin, and Västfjäll (2012) examined the roles of music choice, social context, and listener personality in emotional reactions to music (i.e., self-reported emotions, skin conductance, heart rate). Rawlings and Leow (2008) examined the role of psychoticism and sensation seeking, while Lehmann (1997) assessed the influence of the listener’s formal music training on affective responses to music listening. Another study (Sakka & Juslin, 2017) investigated whether listeners showed different patterns of emotional reactions to music depending on the level of depression. Gupta and Gupta (2014) compared the psychophysiological responses to music-listening (i.e., blood pressure, heart rate, self-reported affect) in male coronary patients and healthy controls.

Lundqvist et al. (2008) aimed to distinguish, whether music evoked genuine emotional responses in listeners or whether listeners merely perceived emotions expressed by the music. They measured self-reported emotion, facial muscle activity, and autonomic activity in music listeners. Correspondence between emotion components was also investigated by Rickard (2004), who explored whether music which elicited intense subjective emotions produced higher levels of physiological arousal than less emotionally powerful music. Lastly, Waterman (1996) focused on explicit and implicit response effects when listening to or performing music. In contrast to authors exploring genuine responses, Hargreaves and Colman (1981) explored the frequency of affective responses that are subjective and evaluative (e.g., “cheerful,” “weird,” “horrible”).

Ten studies explored listeners’ BRM. Six of these refer to body reactions accompanying ARM, and have been mentioned above (De Vries, 1991; Gupta & Gupta, 2014; Liljeström et al., 2012; Lundqvist et al., 2008; Rickard, 2004; Saiz-Clar & Reales, 2017). Caravaglios et al. (2019) explored differences in cognitive functioning between people with and without musical training, as measured by electroencephalographic (EEG) and behavioral responses during an experimental task tapping into attention and monitoring mechanisms. Brain responses evoked by music were also investigated by Wen and Tsai (2016). These authors recorded cortical activity, examining how the auditory-evoked magnetic fields were affected by harmonizing music of rapidly changing tonalities. Sims (1988) evaluated movement responses to characteristics of musical phrases. Subjects individually performed a movement activity designed to elicit reactions to the varying phrase structures and stylistic characteristics of the music. Finally, Fachner (2014) reported research on the music effects on neural processing in brain regions that are implicated in music, language, and emotion processing.
Eight studies measured PRM. Daynes (2010) and Holbrook and Anand (1990), mentioned earlier, went beyond emotional responses and investigated also perceptual responses to music (e.g., awareness of details of music, perceived activity). Fredrickson (1995) used the Continuous Response Digital Interface (CRDI)\(^3\) to measure musicians’ and non-musicians’ perceptions of ongoing “aesthetic” response, in an attempt to determine if musical “tension” was related to the aesthetic experience. Durkin and Townsend (1997) studied responses to musical pitch tests, and Block (1983) examined tone-color responses of musicians with absolute pitch or good relative pitch. Before mentioned, Hargreaves and Colman (1981), proposed four other categories of response to music, beyond affective, namely: categorical (classifies music as representing a particular style, e.g., folk, pop, classical), objective-analytic (refers to “technical” elements, e.g., tempo or instrumentation), objective-global (refers to qualities of the music as a whole e.g., “religious,” “twentieth century”), and associative (extra-musical associations, e.g., “birds singing,” “the sea”), and explored how frequently each of these categories was used when people described musical extracts. The remaining two articles dealt with “musical cognition and aesthetic response” (Swanwick, 1973) and “verbal and exploratory responses to melodic musical intervals” (Maher & Berlyne, 1982)\(^4\).

Two studies explored ORM. Beyond physiological and affective responses, Gupta and Gupta (2014) also explored changes in life satisfaction, optimism, and hope due to exposure to music. Bennett and Ginsborg (2018) studied the effect of providing program notes of unfamiliar music on the listeners’ reactions during musical performance (reactions to music are understood in a more general way).

To sum up, with regard to ARM, studies explored the role of music characteristics (\(n = 6\)), the role of individual features such as personality, musical training, or health (\(n = 2\)), or channel of information processing (\(n = 1\)). Studies on BRM investigated body responses in ARM (\(n = 6\)), referred to the brain activity (\(n = 3\)) or body movements (\(n = 1\)). PRM research focused on the ability to recognize music structure, pitch or tone-color responses (\(n = 4\)), perceived aesthetic responses (\(n = 2\)), perceived activity (\(n = 1\)), or categorical, objective and associative responses to music (\(n = 1\)). ORM studies explored changes in personal characteristics (\(n = 1\)) and general responses to music (\(n = 1\)).

\(^3\) This device gives listeners an opportunity to respond non-verbally while music is being played.

\(^4\) Due to the lack of access to the full texts of these last two publications, we only cite their titles here.
DISCUSSION

This content analysis was performed in order to identify and describe the themes in research on creating, practicing, and responding to music published in PoM. Searching for research on responses to music yielded the largest number of relevant studies, and searching for research on music creating revealed the smallest number of relevant studies. We proposed to organize the literature into 17 topics. The largest number of studies investigate PMC, SRL, EMP, ARM, and BRM.

Based on this review, it is possible to suggest some areas that may need further attention in research. The aims of studies on PMC showed that researchers investigated the role of experience, motivation, and behavior. However, the list of music making predictors presented in this review is not exhaustive. For example, although many theories show that mood has an influence on creative thinking (Baas et al., 2008), affect was not taken into account as a determinant of music making in the studies included in this review, except in one study (Eskine et al., 2018). Also the environment can determine the opportunities to engage in music making, as some cultures do not value musical composition while in others creating music is highly important for society (Hallam et al., 2018). From the analysis of research on practice, it appears that formal instrumental practice is the most commonly studied phenomenon, while other learning activities, such as practicing improvisation or the ability to recognize sounds, are rarely explored. In case of responses to music, research has mainly focused on ARM, BRM, and PRM, and there has been only one study on personal characteristics change. Future studies may fill these research gaps.

The results of the research mentioned in this review can be applied for practical purposes in music psychology. A large body of research on affective responses to music can inform music therapy, and research on SRL and its effects on musical achievement can be taken into account in the management of teaching and learning strategies, helping psychologists and teachers to improve the quality of their work with musicians. Our comprehensive review of musical creativity research can also be considered an important source of knowledge for people who create music themselves or who are responsible for providing others with opportunities to learn musical composition or improvisation.

Given the constrains of this analysis, however, the list of topic categories that we have developed, as well as the description of these categories, is not perfect

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5 Also, the experience of flow, which is regarded as an “exhilarating feeling” was measured in two studies, but only in the context of collaborative composition process.
and may not fully reflect the contents of the journal. Our analysis had a very broad scope; we therefore searched the literature on practice and responses to music based on article titles only, as it would be difficult to manage and describe more research items in a single review article. As, for example, the titles of some studies on musical practice may not contain the word “practice,” there is a risk that we omitted some papers about the selected topics published in PoM. It is therefore not possible to say whether the differences between the number of studies on music creating, performing, and responding (e.g., the smallest number of research on music creating) reflect the actual differences in researchers’ interests or whether they are caused by the weakness in our search methods. Also, this article covers the contents of one of the key journals in the domain of music psychology, and there arises the question of the generalizability of its findings.

Future research can apply a more systematic approach to the literature review (Booth, Sutton, & Papaioannou, 2012), utilizing more focused research questions, refined search methods (e.g., the use of synonymous search terms; the inclusion of other journals and databases). In subsequent reviews we propose to present information on study characteristics, the characteristics of the study samples, measurement tool(s), the description of the intervention, and the results. Having such data, researchers can spot specific gaps in research and future studies to fill them. Although in this article we have presented only a simple analysis of the topics included in PoM, the results of our analysis and those of future review studies can help to integrate and summarize the available knowledge, enabling the strategic planning of new research as well as informing psychological and educational practice.

CONCLUSION AND ISSUE CONTENT

By referring to the concepts of “creating,” “practicing,” and “reacting” to music, we set the scene for further psychological explorations in Poland and thus announce the next thematic issue of AoP. So far, this journal has rarely referred to the psychology of music (Iskra, 1998; Hekiert & Igras-Cybulskia, 2019). However, lately AoP published an issue entirely devoted to the field of music psychology, more specifically to psychological reactions to movie music (Chelkowski-Zacharewicz & Paliga, 2019), the perception of musical structure (Podlipsn, 2019), music therapy for preterm infants and their parents (Bieleninik & Ghetto, 2019), and musicians’ study addiction and examination stress (Atroszko, Wróbel, Bereznowski, & Lawendowski, 2019).
The current issue of AoP adds to the previous work, helping to understand the measurement of affect induced by music, the psychological functioning of musicians, and the way they create and practice. The issue begins with a review on theories explaining musical idea generation by Natalia Copeland (2019). Next, there is the study on jazz and classical musicians’ coping skills by Anna Nogaj and colleagues (2019), followed by Stella Kaczmarek’s (2019) study on teenagers’ mental practice. The last article, by Maciej Janowski and Maria Chełkowska-Zacharewicz (2019), presents a review of studies on music-induced affect, exploring, whether these studies measure real (basic) emotions, or rather affect or music emotions.

The papers included in this special issue cover a wide range of topics related to “creating, practicing, and reacting to music,” providing important information on the person–music relationship. Due to its intricate and complex nature, it is recommended to conduct further research analyses in this area, in line with the aim of PoM, which is to “increase the scientific understanding of all psychological aspects of music and music education.”

REFERENCES


*Publications included in the review are marked with an asterisk (*).


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CREATING, PRACTICING, AND REACTING TO MUSIC


