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The human capacity to learn from experience is unmatched in the animal world. We are unique in the ways we can transfer and adapt what we have learned to new situations. Take away this capacity, and all aspects of human intelligence, including understanding, classifying, reasoning about, interpreting, evaluating and indeed inhabiting present events, as well as forming expectations and making predictions about future ones, would disappear with it. The remarkable plasticity of the human brain, which continually rewires itself by forming new neural connections, allows us to adjust to changing conditions in the environment by applying what we already know from past experience to current situations, thereby fine-tuning our responses to them. Our surroundings, entrust to our existing knowledge for its understanding and making, are continually rendered familiar for us. Philosopher Martin Heidegger regarded our sense of familiarity with the world as the essence of being human (1962) - or a specifically human way of being - and argued that perception and experience are indeed driven by a 'referential whole' made available by our deep-rooted sense of having-already-been-acquainted with our environment.¹

The process of becoming familiar with the world starts in the womb, notably through the sense of hearing. Research indicates that hearing is normally fully functional before birth (Lecanuet 1996) and newborns come into a world that is already acoustically familiar, particularly through pre-natal experiences with the prosodic and melodic features of the mother's voice (Welch 2005). It is also an affectively familiar world where the newborn instantly recognizes and responds to the greater emotional expressiveness of the mother's speech - evident in its pitch level, contour, tempo and rhythm - and displays a preference for it over women's 'usual' speech (Trehub 2003). Starting at birth, the dynamic between the familiar and the non-familiar shapes all our cognitive and affective relationships.

¹ In Heidegger's words, 'My encounter with the room is not such that I first take in one thing after another and put together a manifold of things in order then to see a room. Rather, I first see a referential whole ... from which the individual piece of furniture and what is in the room stands out. Such an environment of the nature of a closed referential whole is at the same time distinguished by a specific familiarity. The ... referential whole is grounded precisely in familiarity, and this familiarity implies that the referential relations are well-known' (cited in Dreyfus 2001, p. 103).
with our environment and continues to form the basis of all learning, or further acquisition of knowledge.

The concept of familiarity, which defines a psychological phenomenon, is relational in that it involves features of both the environment and the human subject. The contribution of the environment to one's sense of familiarity happens in the form of regularities: stable, coherent and repeating patterns of phenomena are necessary for humans to develop familiarity with the world. The human mind, in turn, actively constructs familiarity by recognising such repeating patterns and similarities, forming and storing mental representations of them, and retrieving what has been stored as and when required so as to mobilise existing knowledge to make sense of - and make decisions about - new contexts and situations. Familiarity is made manifest in one's behaviour through observable signs, such as ease - and confidence - in one's involvement with the world, and entails more than the mere recognition of similarities between past and current experiences: it also implies understanding oneself as part of certain social and cultural practices such that one experiences them as being immediately meaningful, and feels at home within the contexts they provide.2 In this sense, familiarity merges generic knowledge about the way things usually are in the world and situated knowledge derived from one's exposure to particular social and cultural practices.

Contemporary psychology assigns a basic role to the concept of familiarity in accounting for the cognitive operations of the human mind. For example, the way the cognitive process of attention is structured is typically explained by reference to one's sense of familiarity with objects, events, people and situations: highly familiar stimuli, which concern the most stable, repetitive, constant features of the environment, do not need to be consciously processed at every encounter with them and in this sense they move to the perceptual background, freeing attention to focus on novelties. There is evidence to suggest that familiarity not only organises the allocation of attentional resources but also recruits different kinds of neural networks in comparison to the processing of non-familiar information (Goel, Makale and Grafman 2004).3 Familiarity further facilitates the achievement of cognitive tasks by rendering many of the steps involved in the processing of new information and the retrieval of stored ones automatic: the more one is familiar with what is currently encountered, the less cognitive effort is required to understand and make decisions about it. Consequently, in a goal-oriented context, familiarity becomes an immensely advantageous - and therefore highly desired -

2 In this sense, the concept of familiarity is different from that of habituation, which refers to a phenomenon observable in virtually all biological systems and signifies a decrease in behavioural response to repeated stimuli without necessarily invoking conscious awareness of the stimuli or of the response.

3 Recent research using data gathered by means of functional magnetic resonance imaging (fMRI) techniques provides evidence that, when humans reason about familiar and unfamiliar situations, they not only employ attentional resources differently, but also utilise different parts of the brain (Goel et al. 2004).
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Music concert, and has consequently developed certain expectations about the practice of attending performances in this tradition, does not have to continually evaluate every detail in the concert hall as she takes her seat and waits for the music to start. The relevant schema informing the current experience provides not only the background feeling of familiarity with the kind of event that is about to unfold, that is, a classical music performance, but also about the appropriate ways of acting during the event.

As music in its many diverse manifestations is a universal trait of our species—there has never been any culture or period in human history that lacked music—one would naturally expect familiarity to play a basic role in our musical experiences and behaviour. Over the last several decades music psychology has provided abundant evidence that familiarity is indeed at the root of our cognition of and affective responses to music. A frequently employed term in this connection is the ‘experienced listener’ (or cf. Chapter 5, where the author uses the term ‘qualified listener’). A Generative Theory of Music (1983) by Fred Lerdahl and Ray Jackendoff, which is regarded by music psychologist John Sloboda (2005, p. 102) as the work with which music psychology came of age, begins by stating the goal of a theory of music to be a formal description of the musical intuitions of a listener who is experienced in a musical idiom (Lerdahl and Jackendoff, 1983, p. 1). The authors go on to explain that by ‘the musical intuitions of the experienced listener’ they mean:

the largely unconscious knowledge (the “musical intuition”) that the listener brings to his hearing—a knowledge that enables him to organize and make coherent the surface patterns of pitch, attack, duration, intensity, timbre, and so forth... A listener without sufficient exposure to an idiom will not be able to organize in any rich way the sounds he perceives. However, once he becomes familiar with the idiom, the kind of organization that he attributes to a given piece will not be arbitrary but will be highly constrained in specific ways. (p. 3)

The hypothesis put forward by Lerdahl and Jackendoff, which received corroborative experimental support (for example, Krumhansl 1990), is that long-term exposure to a musical idiom generates schemata regarding musical syntax—that is, mental representations regarding tonal, rhythmic and metric features of music—such that a new piece of music in the same idiom will be understood spontaneously—and without formal training—by the listener. In this sense, one can speak of one’s native music, similar to one’s native language, the grammatical rules of which are learned early on during the developmental process without any training.

Familiarity also appears to play a major role in shaping our affective responses to music. Cross-cultural comparative research indicates that listeners who are familiar only with the music of their own culture have difficulty in perceiving the affective content of music from another culture; they also develop unconventional affective responses to music in an unfamiliar idiom, such as a distinct feeling of unease or discomfort in the face of a largely incomprehensible musical syntax (Gregory and Varney 1996).

The possibility of any communication of musical ideas and emotions depends upon the existence of a shared musical tradition that is familiar to composers, performers and listeners alike. Everyone within that tradition would have generic knowledge about how her ‘native’ music behaves. However, as a highly skilled musical activity requiring extensive physical and mental training, performance in the Western classical tradition involves specialist knowledge, not always shared by non-performing listeners, and acquired in accordance with these particular requirements. Hence, exploring the role of familiarity in shaping the musical activities and experiences related specifically to the making of musical performances necessitates the introduction of further conceptual differentiations.

Some Conceptual Considerations

Musical performance is one of the most complex accomplishments of our species, and ‘at its best, is indicative of the upper limits of human physical and mental achievement’ (Wittmann 2004, p. 7). In order to attain expertise in performance, musicians need to acquire not only high levels of technical mastery in playing a musical instrument—or in applying one’s voice musically—but also vast amounts of knowledge to develop meaningful and effective interpretations of the music they play. Research indicates that experience plays a large role in performance expertise in the Western classical tradition (Lehmann and Ericsson 1998), and a successful musical performance depends on the operation of diverse kinds of schemata, representing motor, cognitive, affective and social knowledge that performers develop over many years. Before they become expert performers, musicians acquire a substantial degree of familiarity with the diverse components and conditions involved in performing music.

The kinds of musical behaviour and performances that can be described and explained by reference to the all-embracing umbrella term ‘familiarity’ display a wide range—both a novice and an expert can be said to be familiar with a musical instrument or a piece of music—and one cannot speak of universally recognisable behavioural or psychological criteria that would define a norm in the application of this term to differing performance contexts and situations. Consequently, conceptualising familiarity such that it retains its explanatory value in relation to musical performance necessitates laying down certain specifications. The first of these is the identification of the perspective one wishes to investigate: for example, merely observing the behaviour of performers and the sound of their performances would not be sufficient to draw any meaningful conclusions regarding their degree of cognitive familiarity with a given piece unless we also note the performers’ level of prior experience in performance making. Expert performers who are familiar with a piece of music will be working with significantly different musical schemata compared with beginners who are familiar—at their own level of skill
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and knowledge – with the same piece; consequently, in order to explore, for example, the impact of cognitive familiarity with a piece on its performance, it is essential to note whose perspective is being investigated.

At the most basic level, in order to be able to perform any kind of music at all, one needs to have generic knowledge about how to play an instrument, and particular knowledge about the gestural and expressive aspects of a given piece of music. Each musical instrument requires specific technical skills – for example, vibrato in string playing, independence of hands in piano playing (Shoboda 1985, p. 93) – and the know-how that one acquires when learning to play an instrument is the basis of motor familiarity as a pre-condition of performing music with fluency, rhythmic precision and appropriate speed. In the words of Jonathan Dunsby, one of the purposes of practice is to develop a “fluid “motor” ability to pass through musical time in performance without giving conscious thought to the multiple, vastly complex effort involved: it teaches the musician to “walk”, “run”, “jump”, indeed we might even say “speak music”” (Dunsby 1995, p. 40). It is a well-established fact that, in order to attain expertise in musical performance within the Western classical tradition, one has to start gaining motor familiarity at a very young age, and skills to achieve high levels of performance are acquired through intense practice over a very long time – a minimum of 10 years according to existing research (Ericsson, Krampe and Tesch-Romer 1993). There are great differences in the motor abilities of musicians between the earlier and later stages of this developmental process (ibid.), the implication being that motor schemata undergo substantial transformations throughout the preparatory years: it is not merely the degree of motor familiarity that distinguishes the earlier and later stages, but the musical schemata themselves evolve to acquire different structures, knowledge becoming better organised with increasing expertise. In a real sense, an expert performer’s familiarity with a musical instrument is qualitatively different compared with a novice in terms of the knowledge that defines and drives the motor interaction with the instrument.

Another factor that has to be taken into account in exploring the role of familiarity in relation to musical performance is the cultural context or the performance tradition within which the performer’s experience and knowledge are put into practice. For example, a performer’s familiarity with a piece of music in the Western classical tradition would be based upon their knowledge about notational conventions, the historical style of the piece, the cultural codes of musical expression, and so on. In an oral culture, on the other hand, where each performance introduces improvisatory differences into the pitch and rhythmic domains of a piece, familiarity would imply knowledge about the background structural features rather than about each and every surface detail. Each musical culture entails different kinds of knowledge and experience for the making of a successful performance. Even within a given culture, the researcher has to be aware of changing performance traditions and the changing expectations of audiences. For example, contemporary performance practice within the Western classical style obliges performers to give performances of a reproducible kind – an outcome

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not only of dramatic developments in performance virtuosity over the last century (Lehmann 2006), but also of the technical possibilities offered by recording technology (Philip 2004, pp. 21–2 and 244–50). Consequently, variability or inconsistency in the performance standards of a musician is much less tolerated today than it would have been during the early part of the twentieth century. A present-day performer would spend a lot more time in becoming intimately familiar with the structural and expressive details of a piece while preparing for a concert in comparison to a musician from this era. changing performance traditions mean that the way performers learn a given piece of music also changes in terms of the flexibility of the expressive details that are committed to memory.

Since there are multiple ways of coming to know a piece of music, studying the role of familiarity in performance also requires specifying the nature of the process through which familiarity has been attained; there could be significant differences in the details of a performance depending on whether the performer acquires familiarity with a piece only by aural means (for example, through the Suzuki method, by listening intensely to the performance of another musician), by detailed score analysis, or through intuitively driven personal practice. Each of these processes would generate different kinds of cognitive schemata about the piece in question. For performers, coming to know a piece of music is strictly related to how they want it to sound, and in this sense the starting point is always the sounding score. Performers do not normally analyse a score prior to its production in sound, and if theoretical analysis is undertaken at any stage, this is driven by performance-oriented concerns. Furthermore, while a score-based analysis aims to understand how a piece works – how its structure is created so as to make musical sense – for the performer, the aim of becoming familiar with the music is to make it work in sound by creating an effective performance. Consequently, the performer’s activity involves a powerful aspect of making something, as distinct from merely observing and contemplating. A performer – qua performer – cannot acquire familiarity with the structural and expressive elements of a piece separately from the physical component required to produce them in sound. The kinaesthetic sensations and the physical gestures are a very real part of how a performer comes to know a piece of music, and the cognitive and motor schemata regarding its performance evolve simultaneously. The markers of cognitive familiarity are closely bound up with motor factors, and without the motor component, a performer cannot display cognitive familiarity with a piece in performance.

Research in musical performance has largely identified the processes through which a performer becomes familiar with a piece as those taking place in practice sessions and rehearsals. To be sure, practice is an essential part of the process of becoming familiar with a piece of music, and it ensures that the technical

4 Some of the ideas in the rest of this paragraph were first formulated in a paper entitled “Practice and Theory: Ways of Knowing Music”, presented at the 5th Conference on Systems Research in the Arts, Baden-Baden, Germany, in 2006.
dimension becomes largely automatic so that the performer can direct attention to the interpretative and expressive features of the music in performance. According to a commonly accepted hypothesis, there is a direct relationship between the structure – rather than quantity – of the practice and the quality of the performance (Ericsson 1997; Williams 2004; Williamson and Valentine 2000). Susan Hallam’s research (1997) revealed substantial differences between the practice strategies of experienced musicians and novices such that the former can ‘draw on a musical knowledge base which enable[s] them to assess the task, identify task difficulties, recognise errors, monitor progress, and take appropriate action to overcome problems’ (Hallam 1997, p. 103). In this sense, performers acquire expertise in practicing as well as in performing music. While practice is the primary activity through which performers become familiar with a piece, learning to perform it effectively does come to an end in the practice room. How performers continue to learn on stage, through live performances, remains a largely neglected area within music performance research.

The Alchemy Project

The practice-based research project entitled Alchemy in the Spotlight: Qualitative Transformations in Chamber Music Performance, funded by the AHRC5 and directed by this author, is to my knowledge the first research undertaken to explore live performance from the perspective of professional performers in the Western classical tradition.6 The aim of the project was to explore the experience of performing live in the context of a professional piano trio, and to compare and contrast the individual as well as the collaborative cognitive, affective and social processes that shaped a live performance with those that defined rehearsals. The project further aspires to raise awareness of live performance as the ultimate norm or the golden standard in classical performance practice, the articulation of which is particularly important in an age when performances recorded and edited in the studio provide the context for an overwhelming majority of musical experiences. As such, it forms an initial step towards counter-balancing the excessive focus in contemporary performance studies on a ‘musicology of recording’ (Cook 2010).

One of the most important hypotheses put forward by the Alchemy project was that a prerequisite for an elite performance is the familiarity acquired with a piece through live performances. It is argued that there is a kind of schema for musical performance that can be developed only on stage and not in the practice room. Performers do continue to learn on stage, and the kind of knowledge that is thus acquired becomes the basis for future superior performances.

The comparisons between the processes of the rehearsals and the live events undertaken as part of the Alchemy project (documented by means of audiovisual recordings, preparatory and reflective diaries, and interviews) suggest a new conceptualisation of live performance that challenges established notions in musicology. According to the received view, the purpose of practice and rehearsal sessions is to develop and fix an interpretation that is then unfolded for audiences during a live performance: in other words, performing live is more or less a repetition of what has been determined and achieved in the practice room. Such a conceptualisation is, however, inadequate in that it fails to explain the true nature of a live performance: for elite performers, the aesthetic aim of a live performance is to surpass what has been achieved in rehearsals and to bring about a certain qualitative transformation that is recognised as ‘magical’ by both themselves and audiences. During a live performance the cognitive-affective world of the performers and consequently the interpretation of the music they play often undergo certain positive qualitative transformations, which involve processes peculiar to live contexts as distinct from those involved in rehearsals and practice sessions. Among such transformations are an increasing sense of expressive freedom, increasing affective involvement with the music leading to an experience of flow (Csikszentmihalyi 1990), the making of unplanned creative interpretative choices, and the experiencing of certain alterations in time-consciousness. Positive qualitative transformations of this kind are most likely to transpire under optimum psychological, social and acoustical conditions, although they can also be achieved in less favourable circumstances. Being familiar with the processes involved in performing live is an important factor that facilitates the emergence of performance magic.7

There are two kinds of knowledge acquired specifically on stage that come to determine a performer’s schema for live performance. One is the knowledge concerning particular pieces of music: anecdotal evidence by performers supports the hypothesis of the Alchemy project that a significant part of learning to perform a given piece effectively, convincingly and indeed exquisitely takes place on stage. For instance, pianist Sviantyevich Richter revealed that it was only at his fourth public performance of Mozart’s Piano Sonata in A minor that he was able to achieve what he considered a satisfactory interpretation (in Neuhau 1993, p. 206). Although the number of live performances required to make a given piece

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5 The Arts and Humanities Research Council (AHRC) funds postgraduate training and research in the arts and humanities, from archaeology and English literature to design and dance. The quality and range of research supported not only provide social and cultural benefits but also contribute to the economic success of the UK (for further information, see http://www.ahrc.ac.uk).

6 The project website, designed by Dr Stephen Boyd Davis (Head of the Landown Centre for Electronic Arts, University of Middlesex) and maintained by the University of Middlesex, can be visited at http://www.mdx.ac.uk/alchemy.

7 In the context of chamber music, the positive qualitative transformations in question do not necessarily happen simultaneously as the three musical parts do not involve the same kind of technical and/or expressive demands at every point: it is, therefore, perfectly possible for the co-performers to experience the transformations at different points along the piece.
work aesthetically vary from one performer to another, Dunsby articulates the general consensus about the necessity of repeat performances by writing that:

> Many performers experience the fact that learning and performing a new piece of music does not happen all at once. The first performance, as good as it may be, is not as satisfactory as the second, and – though I can prove this only anecdotally – it is the third performance where magically everything seems to come together ... What is going on during those two gaps that may be hours apart or months? Clearly some kind of unconscious thinking, often called "assimilation". (Dunsby 1995, p. 10).

The other kind of knowledge that performers attain on stage concerns the particular nature of performing live. Acquiring familiarity with the conditions of live performance is necessary in order to develop performance expertise. In a live context, the performer has to work within an environment that involves two kinds of constraints: one of these is the inherent indeterminacy of the event, and the other is the necessity of uninterrupted flow. The indeterminacy is related to the "living" nature of the performance environment such that at any moment an acoustical, psychological or social incident in the performance venue could displace the attention of the performer as a novel stimulus away from the music and from a focus on performance making – an unexpected noise, the room temperature rising or an audience member falling asleep can all disrupt the performer’s concentration. As Dunsby argues, unpredictability plays a fundamental role in musical performance, and "although the performer can seek to eliminate some uncertainties, there will always be others" (Dunsby 1995, p. 12). The aesthetics of live performance in the Western tradition obliges performers to keep going in the face of disruptive occurrences, and the more familiar performers are with the constraints of live performance, the better they will be able to keep themselves focused on their music making, and smooth out any potential discontinuities. Expert performers are able to create the illusion – by mobilising a remarkable range of skills and experiences – that they are in total control of the performance situation physically, mentally and aesthetically, even though in practice this is never the case. The received musicalological notion that a live performance is essentially a repetition of what has been achieved in the practice room is, therefore, erroneous in that it does not take into account the restrictions that the live context imposes on the performer. The cognitive-affective processes involved in the preparatory phase do not lead to those that shape the live event through the logic of linear causality, and consequently it is not possible to understand all that happens in a live performance by reference to the preparatory processes alone.

An important consequence of the unusual nature of live music making is that there is no guarantee that the performer will be able to make "magic" on stage even if earlier practice sessions involve, and promise, high levels of achievement: in the art of musical performance past success does not necessarily secure future accomplishment. Aside from the constraints of performing live, an important reason behind this fact is that part of the performer’s familiarity with a piece of music – particularly, though not exclusively, its motor component – that makes its performance possible involves a continuous process of renewal, and not just retrieval of knowledge and experience. Performers are always at risk of losing their thorough familiarity with the various components that drive a musical performance (Dunsby 1995) and falling back to an earlier stage in their development of expertise – a condition that lies at the heart of the emotional peculiarities of Western performance practice. In this sense, familiarity, if it is to have any material impact on the performance of music, needs to be actively retained through regularly repeating encounters with the conditions of music making both in the practice room and on stage.

While the original aims and objectives of the Alchemy project were designed with Western classical chamber music practice in mind, implying an investigation of ensemble music making in general, after the beginning of the project it quickly became apparent that a piano trio is a specific kind of group that functions in accordance with its own criteria of ensemble identity and dynamics. It is different from, say, a cello–piano duo because of the increased size of the group and the attendant complexity of managing interactions between co-performers. It is also different from a string quartet owing to the contrasting nature of the two kinds of instruments involved, namely the piano and the strings. Nevertheless, a piano trio functions in accordance with some of the basic principles that drive any successful chamber music ensemble. In addition to familiarity with the music to be performed, ensemble performance also involves the component of social familiarity between co-performers. Since the Marmara Piano Trio, whose practice forms the research arena of the Alchemy project, was specifically founded for this particular investigation, the performers did not know each other at a personal level prior to the beginning of the project. Psychological research provides abundant evidence that, for any collaborating group of people to work well, there needs to be a sense of trust, support and openness between them, and a sense of belonging in the group (Douglas 1993). Research by Young and Colman on string quartets (1979), for example, indicates the vital role of group closeness, cultivated through trust and respect, for the healthy functioning and longevity of the ensemble (also see Chapter 12).

The general consensus in collaborative practice and research is that "unless collaborators know each other well at a personal as well as meaningful level, the collaboration is almost inevitably headed for trouble at some point" (John-Steiner 2000, p. 278). In a very significant sense, table-fellowship is an integral part of musical fellowship in chamber music. The processes that build trust, mutual respect and support, and constructive ways of criticising when things go wrong, take place not only during rehearsals, but also during other kinds of social activities such as travelling together for performances. While social familiarity in an ensemble context is thus a significant factor leading to performance achievement, it is difficult, if not impossible, to specify the amount of social familiarity that is required for success on stage as a group. The most vital criterion seems to be one’s
subjective evaluation of being comfortable and happy in one's role within the ensemble; this can happen very early on during the life-time of the group, or not at all even after substantial acquaintance with one's musical partners, in which case the longevity of the ensemble would be seriously jeopardised. As far as the success of a particular performance is concerned, however, the Alchemy project provided evidence that a high degree of social familiarity among expert performers in a piano trio is not a necessary condition: the very first concert given as part of the project happened shortly after the trio was established, when the co-performers had not yet had time to develop strong social bonds, yet the performance was judged to be successful both by the performers and by the audience. Another indication of the Alchemy project was that the degree of social familiarity among the members of the trio influenced the way the rehearsal sessions were structured and conducted: rehearsal patterns changed with increased social familiarity. In the case of the Marmara Piano Trio, while earlier rehearsals displayed more verbal communication, and more caution in making critical comments, later ones involved less talk but increasing ease in the making and receiving of criticism, which supports the findings of other research on communication between co-performers in practice sessions (for example, Williamson and Davidson 2002). Commenting on one's musicianship is a sensitive issue as it implicates the self and how it is perceived, and only increasing social familiarity can build the trust that facilitates the expression of concerns, doubts and self-criticism. It appears that, once the musical skills and competence of the co-performers are established and confirmed through consistently achieved musical standards in various performance situations, the risk of interpreting critical remarks personally rather than as a means to improve the overall performance quality of the ensemble decreases steadily. Interestingly, in the case of the Marmara Trio, it was also found that, during both the earlier and the later stages of the project, verbal praise for each other's musicianship was given sparingly during rehearsals, although there would be clearly understood non-verbal communication of admiration following a beautifully played phrase, an expressive intonation or a singing piano line. Based on the dynamics of the Marmara Trio, it also became apparent that a piano trio, unlike a string quartet, does not necessarily function around an agreed leader, and that the music itself dictates which instrument will lead at any moment: this is in part due to the fact that there is no natural instrumental hierarchy in a piano trio, which is composed of two different kinds of instruments, and also due to the smaller size of the group in comparison to the string quartet.

Developing cognitive familiarity with a new piece of chamber music involves processes that are different from those concerning the learning of a solo repertoire. In the context of chamber music, the process of becoming familiar has an essential collaborative dimension: in learning and internalising a new piece of music, performers in a chamber ensemble simultaneously internalise a system of shared activity, and separating familiarity with the music from group interaction is very difficult, if not impossible. One of the important pedagogical questions is whether performers in a chamber ensemble should learn their individual parts in detail, together with the desired expression. It became clear early on during the Alchemy project that learning and developing an interpretation of one's own part individually can actually hinder putting the parts together musically with a unified ensemble voice. An important part of the process of becoming familiar with a new piece has to be achieved collaboratively as a trio, and a more or less common representation of all three parts of the music needs to be developed together. The more complex a work is, the more urgent such collaborative learning becomes. A vital aspect of chamber music making is listening intensely to the other performers while playing, and one can develop a schema for this kind of interaction only by working within an ensemble. Owing to the different manners of sound production involved by the keyboard and the strings, and the necessity of bringing the three instruments into accord technically and expressively, becoming familiar with a work for piano trio requires collaborative learning. Example 13.1 shows bars 104-08 from the first movement of Beethoven's Piano Trio Op. 70 No. 2 in E-flat. On the downbeat of bar 106, the violoncello technically needs extra time to start the theme with a grace note, having ended the previous phrase with a note preceded by its grace note; the pianist cannot predict the particular timing required at the beginning of bar 106 based on familiarity with only her part, which involves a rapid descending scale to be played leggiermente. The pianistic intuition here would be to reach the downbeat of bar 106 in one single impulse without any delay, whereas ensemble unity requires adjusting the timing of the piano part to the timing of the violoncello.

With regard to the relationship between cognitive familiarity with a piece and its performance, the Alchemy project indicated that, during rehearsals, performers reach a saturation point beyond which attempting to increase the familiarity by further detailed rehearsals does not improve the music making until the live historically, a unified ensemble voice has not always been an aesthetic aim in chamber music making: Robert Philip (2004, pp. 104-39) discusses numerous examples from recorded history that attest to a casual attitude, a "general informality" towards ensemble coordination, balance and expressive styles. 'Generally speaking', he writes, 'the best ensembles of today rehearse so that everyone agrees, not just about tempo but also about details ... In early twentieth-century recordings, there are sometimes startling contrasts between two or more musicians playing together' (p. 165). Nevertheless, there is a basic asymmetry in the way the pianist and the string players in a piano trio learn their respective parts in that the former has access to the complete score right from the beginning of the learning process, while the latter have only their own parts. Furthermore, while evidence indicates that solo performers can replicate the timing and dynamic nuances of a performance even over long periods of time, there is no research to show that these expressive parameters can thus be replicated in chamber music performance. Based on my experiences with the Marmara Trio, I would propose that chamber music has a more variable dynamic, and fewer expressive details are retained in long-term memory compared with those of solo pieces of music.
Example 13.1 Beethoven, Piano Trio in E-Flat, Op. 70 No. 2, I, bars 104–08

The performance actually takes place. In this sense, knowing when to stop rehearsing is an important factor for performance achievement. To be sure, the amount of preconcert rehearsal and practice each performer requires is different: some prefer to practice almost until they go on stage, while others do not play at all on the day of the concert. However, there is evidence to suggest that "extensive practice can reduce the ability to control the expression of sound in performance, for ideas become fixed and harder to adjust" (Goodman 2002, p. 157). As Dusbin writes "[n]o musicians believe that it is possible to, as it were, know too much about a piece, for instance, to have such a clear and preconceived idea of the structure that spontaneity of interpretation becomes impossible" (Dusbin 1995, p. 33).

While ample anecdotal evidence by musicians attests to the importance of live performance in solidifying the knowledge of a piece, there has not been any research on the actual psychological mechanisms through which performers continue to learn through live performances. The Alchemy project indicated that there is a strong affective dimension to learning on stage; the kind of familiarity that is acquired with a piece through live performance is highly emotional, and I would hypothesise that one of the mechanisms at work is the representation of the details of a live performance for long-term memory similarly to other emotional experiences, and differently from the experiences performers have during rehearsals. Indeed, the chemistry of an ensemble in live performance is different from the group dynamics experienced during rehearsals. Live performance is the site where the trust and support between co-performers are tested, confirmed and reconfirmed, and acquire their true practical meaning; furthermore, the excitement and the concentration of the live event, which is shared by the co-performers, creates a unique social interaction and further affective closeness among them. The term 'familiarity' is particularly telling for explaining the learning that happens on stage in chamber music: one of the definitions of 'familiar' is "exhibiting the manner of a close friend or pertaining to family" (New Webster's Dictionary, 1984) and living through an intense, even peak experience together — as in a successful musical performance — creates an emotional comfort zone for the ensemble, which becomes part of their schema for live performance guiding future music making.


The other psychological mechanism that leads to learning through the experience of performing live is retrospective: the increasing familiarity acquired through repeat performances throws new light on the musical object and opens the door to further creative solutions to interpretative problems, allowing the performers to experiment with alternatives. It was only after learning and first performing Beethoven's Trio Op. 70 No. 2 with the Marmara Trio that the performers were able to conceive a more creative and effective interpretation of the passage leading to the recapitulation in the first movement. Example 13.2 shows this passage: the recapitulation starts with the upbeat to bar 129 in the piano part, but is preceded by a false recapitulation in bar 127 initiated by the cellos.

Our first live performance of this passage involved a straightforward interpretation of what is written in the score. Later, we realised that it could be much more effective if the music in bars 121–7 gradually got calmer with a perceptible ritardando, leading to a significantly slower tempo in bars 128–9, showing the moment of true recapitulation as if under a magnifying glass. While this interpretation did not occur to us during the six months when we learned and rehearsed the piece, it took one live performance to establish sufficient affective familiarity with, and a sense of ownership of, the piece to be able to introduce a
creative alternative to the shaping of this passage, which has a significant influence on the overall effect on the interpretation of the movement, and its potential to become magical in performance.

Concluding Remarks

The aesthetic impact and power of a musical performance lies in its capacity to intensify the attention of the listeners and their consciousness of the present moment by de-automatising their relationship to the music: a performance at its best breaks down the automated response that familiar pieces of music invite. Similar to Shelley’s poet, the elite performer ‘strips the veil of familiarity from the aural world’. A magical performance makes us aware of our own act of listening, and of its temporality. Performers can achieve such magic – the expressive flexibility to de-familiarise the familiar – only after intimate familiarity with a piece is developed through many live encounters with it.

Research on live musical performance is in its earliest stages, and one of the important challenges for contemporary performance studies is to devise scrupulous research methods to understand and theorise about the processes of live music making. Some of the most significant insights regarding what it means and what it takes to perform music will come from systematically exploring the cognitive, affective, physical, aesthetic and social basis for performers of making music on stage. Such research promises to shed light on one of the most interesting aspects of being a performer, namely the existential basis – the desire – that drives the activity of performing live, by revealing the secrets of ‘the infinite satisfaction’ – to use the poetic words of the organist Dame Gillian Weir – of playing a work one has lived with for [many] years, that [fits] like a kid glove, that [lies] contingently in its warm familiarity deep within the consciousness’ (Weir 1995, p. 352).

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11 In his *A Defence of Poetry* (1819), Percy Bysshe Shelley famously wrote that the poet ‘strips the veil of familiarity from the world’.

12 Two other factors are crucial in preparing for a live performance and, owing to lack of space, they are mentioned here only briefly: one is the familiarity with the acoustics of the actual concert venue, and the other is the necessity for pianists to adjust to an unfamiliar instrument every time they go on stage. Depending on the acoustics of the concert venue, performers often have to make adjustments in tempo, dynamics, articulation and so on within a very short period of time and research is needed to understand the mechanisms responsible for these adjustments. Also, how pianists encode the music they play so that their existing knowledge can be applied to new instruments for successful performances is an important but entirely neglected research area.


