



8TH JANUARY 2020

IMPROVISING MEDICINE

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Observations from a clinician

In four Gresham Lectures during the 2018/19 academic year I explored the idea of medicine as a practice which takes place at an intersection between knowledge, skills and performance. Quite rightly, much emphasis in the world of healthcare education is placed on the acquisition and assimilation of biomedical knowledge and the development of clinical skill. Such knowledge and skill is essential for every healthcare professional. Yet as a patient, it is a clinician's performance that is most evident. In this lecture I draw on my own experience - as a surgeon, a general practitioner, an academic in the field of surgical education, and a patient - to address *improvisation* as an essential component of performance. After a short introduction, the lecture will bring together the perspectives of a clinician and a musician to explore similarities and differences between medicine and music. The lecture itself forms an improvised performance, developing and elaborating ideas that come into being through live conversation.

The word 'improvisation' in the context of medicine often makes people uneasy. It smacks of a lack of preparedness, a casual approach where solutions are knocked up on the spur of the moment. In fact, the opposite is true. To me, the capacity to improvise is the hallmark of a true expert. Improvisation in this sense is the ability to assess and respond to each situation, drawing on knowledge and skill developed through decades of study and applying them appropriately in a new situation.

In clinical practice there is no such thing as a 'typical case' of a disease or injury. Each instance is unique, because each person is unique. As clinicians, we are never *not* improvising. Yet for many, this can be an uncomfortable concept.

I start by reviewing the stages which becoming expert requires. I draw on the widely known progression from apprentice to master, familiar from the mediaeval guild system and present in various forms across the world. A simple categorisation has three stages.

1. As an Apprentice, you spend years working in someone else's workshop, learning to do things as they are already done. You have little independence and are expected to do things in the way the Master requires. Although you will inevitably make mistakes, you are insulated from the consequences of error by the system within which you work. Your role is to conform, not to innovate. Through this process of immersion, you become familiar with the tools and materials you work with, and you gradually develop the skills your trade or profession requires.
2. As a Journeyman (a time-honoured term, which now of course applies to men and women) you leave your Master's workshop and venture out into the world as an independent practitioner. During this stage you are taking responsibility for your own work and for how it lands with publics and audiences. Now you have the opportunity to develop your own style as you establish yourself in your chosen field. You will encounter conditions you have not experienced in your Master's workshop and you have to take responsibility for the errors you will inevitably make. Two processes can seem to pull in opposite directions. 'Not about you' requires you to widen your attentional focus, to be aware of and respond to the environment you are in and



the people you are with. ‘Developing voice’ requires you to acknowledge, develop, embrace and inhabit your professional personality, creating your unique style.

3. As a Master you take on a different responsibility, this time for others following in the path you have chosen. Now you have Apprentices under your tutelage, and your role is to teach, mentor and support them. You have a duty of care, both to learners as individuals and to the stewardship of your field as a whole.

These stages are not always clear cut and progressions are seldom linear. Descriptions of this kind make the process sound more straightforward than it actually is. As the complexity of your work increases, so does the need to respond to the unexpected. As you become more experienced, especially when you reach the cusp between Journeyman and Master, the need to improvise increases. You are constantly faced with new situations and have to respond to what each one presents. Such flexibility is a central feature of expert craftsmanship. This was eloquently described in the 1960s by David Pye, a well-known furniture maker and professor of furniture design at the Royal College of Art in London.

In 1968 Pye published his influential book *The Nature and Art of Workmanship*. ‘If I must ascribe a meaning to the word craftsmanship’, he writes, ‘I shall say as a first approximation that it means simply workmanship using any kind of technique or apparatus in which the quality of the result is not predetermined, but depends on the judgement, dexterity and care which the maker exercises as he works. The essential idea is that the quality of the result is continually at risk during the process of making; and so, I shall call this kind of workmanship “The workmanship of risk”: an uncouth phrase but at least descriptive. In workmanship the care counts for more than the judgement and dexterity; though care may well become habitual and unconscious’.

‘With the workmanship of risk’, Pye continues, ‘we may contrast the workmanship of certainty, always to be found in quantity production, and found in its pure state in full automation. In workmanship of this sort the quality of the result is exactly predetermined before a single saleable thing is made. The most typical and familiar example of the workmanship of risk is writing with a pen, and of the workmanship of certainty, modern printing. [...]. In principle the distinction between the two different kinds of workmanship is clear and turns on the question: “is the result predetermined and unalterable once production begins?”’

To me, medicine and the performing arts are always dealing with the workmanship of risk - not risk in the sense of possible danger, but risk in Pye’s sense that the result is never predetermined.

Two examples from my own experience will illustrate these points.

1. As a trauma surgeon in Southern Africa in the 1980s, much of my work involved operating on patients who had been stabbed or shot. Because of the nature of my patients’ injuries, there was much that I could not predict before starting to operate. The ability to improvise within a close-knit surgical team was a crucial skill. Improvisation required high levels of wordless awareness between members of the team (the ‘performers’ of surgery), and the ability to respond quickly to a rapidly evolving situation.
2. As a general practitioner in the UK the 1990s, I came to see each clinical consultation as an instance of improvisation, where I would draw on the knowledge and skill I had developed over many years in the context of a unique patient. The outcome of the consultation could not be wholly known in advance, as it was jointly constituted by clinician and patient.

Much later I became aware of the huge literature around improvisation in fields outside medicine. Much of this comes from the worlds of the theatre and of music. Keith Johnstone, a distinguished theatre director, published his classic book *Impro* in 1979. In it he describes his work with groups of actors. His central principle is that improvisation depends on willingness on everybody’s part - willingness to listen, willingness to respond, and willingness to work together in a creative way. When a pair of actors was improvising a sketch, Johnstone insisted that every response should start with ‘Yes *and* ...’, building on the other’s move and opening new possibilities. This is the opposite of the ‘Yes *but* ...’ response, which blocks the next move and shuts down possibilities.

Yet for many people, the word ‘improvisation’ is associated with music. Almost synonymous with jazz, improvisation conjures the image of a saxophonist who steps into the spotlight and improvises a solo, with notes that have never been played before, supported by a group of musicians who listen intently and respond in the moment. Improvisation



in classical music is less widely recognised, yet for centuries that has been a cornerstone of expert performance, only falling out of view as a central skill in the last hundred years or so. On closer analysis, there are surprising correspondences between improvisation in the operating theatre, the consulting room and the concert platform, though the obvious differences between medical and musical performance conceal these underlying similarities. This lecture unpacks those similarities in collaboration with a leading specialist in classical improvisation.

Roger Kneebone

Observations from a musician

An odd couple – the structured and the spontaneous

Most western music consumers would probably take it for granted that a Jazz concert is to include improvisation as a part of its fundamental nature. Nevertheless, when it comes to so-called classical music, many are likely to assume that the player's job is to execute the score exactly as it was created and written by the master. Music *is* the score, isn't it? So absolutely no improvisations, please...

Improvisation in art-music performance?

Finding a definitive answer to this question is not a straightforward journey, as it depends on whom you ask... For some, improvisation is the highest artistic phase of the performance. Bach was known to his contemporary general public mainly as a virtuoso organist improviser and, according to Czerny (Sonneck 1927), Beethoven's concerts attracted larger audiences during the extemporised second parts. His improvisations were so fluent that some of his contemporaries considered them to be better than his compositions. In fact, forms such as preludes, fantasias, cadenzas, toccatas and to some extent variations were often home to extemporisations. We know that Chopin never played the same piece alike twice – both as far as the interpretation and the actual notes are concerned – and taught his pupils along the same lines (Eigeldinger 1988). His improvisations were often considered the high point of his performances, as Liszt's improvisations were similarly described. Arabic and North Indian art music are extremely complex from the theoretical point of view. Yet, the improvised parts of the performance are considered to be by far the most essential element, for both the audience and the musicians. For many centuries (until the beginning of the twentieth), this was also the case in European art music.

Yet for some, the term 'improvisation', is suggesting a failure to study and prepare the score properly, artistic arrogance, ignorance or bluffing. (Nettl 2001)

What is improvisation?

Some dictionary definitions, in addition to revealing the complexity involved in defining improvisation, can also demonstrate the evolution of attitudes toward the concept of improvisation in the last generation. Many dictionaries simply indicate the meeting point between composing and performing in real-time. In fact, this is suggested by the term 'extemporisation' itself: ex: out, tempo: time.

In the International Cyclopaedia of Music and Musicians (10th edition, 1975: 1064), for example, we find the following definition: 'a performance on the spur of the moment, without preparation or notes'. The Oxford Dictionary of Music (Kennedy 1985: 348) reads: 'a performance according to the inventive whim of the moment, ie without a written or printed score, and not from memory'. While the 1983 edition of The New Oxford Companion to Music (Arnold 1983: 903) defines improvisation as 'musical performance which is created as it is played, without a notated score or detailed preparation; also, the technique of giving such performance', the 2002 edition of the same dictionary already points out the difficulty in making a simplistic distinction between improvised and non-improvised music (Latham 2002: 905–6).

If before the 1970s musicology tended to treat improvisation as a craft (in contrast to composition which was considered the creative art), there has been a change in attitude towards extemporisation in the last generation. The New Grove Dictionary of Music and Musicians (Sadie 1980) was among the first to adopt an expanded concept of improvisation, approaching it as 'the creation of a musical work, or the final form of a musical work, as it is being performed. It may involve the work's immediate composition by its performers, or the elaboration or adjustment of



an existing framework, or anything in-between' (vol. 9, p. 31; my italics). See also the 'Improvisation' entries in Arnold 1983; Kennedy 1985, 1994; Latham 2002; Randel 1986; Sadie and Tyrell 2001; Thompson 1936.

Similarly, The New Harvard Dictionary of Music (Randel 1986: 392) points out that 'the degree to which a musician departs from a written or memorised work and the extent to which performances differ from each other may also be considered a function of improvisation'. It is in the spirit of this expanded definition that I have approached extemporisation in today's lecture and demonstrations.

Improvisation, real-life and art

It might be helpful to remember that most of us improvise in our daily lives when we respond to unexpected or changing situations. One may argue that extemporising, or spontaneity, is a universal skill, familiar to most healthy human beings, applied in different degrees within different contexts.

The art psychologist R.K. Sawyer coined the term 'everyday creativity' to describe the problem-solving mechanisms applied by human beings in daily life (Sawyer 1999). One aspect of everyday life that resembles music-making is speech intonation: the non-verbal layer of speech. We can think of it as the 'music of the speech'. Any conversation between people contains elements of extemporisation, at least at that level. The franker and more authentic the conversation, the more extemporised it is. Links between emotional expression in speech and music-making is one of the key elements in the way I teach and practice improvisation.

Extemporisation is relevant mainly to performing arts as they obey the flow of real-time: music, movement and dramatic art. The highly organised and structured system of Western art music creates the constraints in which free and spontaneous gestures can move, and dynamic flow can take place. Although planning and spontaneity seem to contradict one another, their co-existence is a condition for any skilfully executed extemporisation.

The approach to musical extemporisation referred to in today's lecture is of a meeting point of several complementary elements in real time: pre-planned/structured approach (involving both conscious and unconscious knowledge) with spontaneity; natural, universal schemes with learned and culturally specific schemes; as well as directionality in time, emotional expression dynamics of communication. It is the intensity of the simultaneous occurrence of these elements that makes extemporisation unique. The catalyst that enables this meeting-point in time to become musically convincing is flow.

Flow

The notion of flow is crucial in the context of creativity in general and music extemporisation in particular, because of music's 'real-time' nature.

The social psychologist Mihalyi Csikszentmihalyi, is considered by many as the founder of the completely involved in an activity for its own sake. The ego falls away. Time flies. Every action, movement, and thought follows inevitably from the previous one, like playing jazz. Your whole being is involved, and you're using your skills to the utmost". (Csikszentmihalyi 1990)

He characterises a state of flow as one in which people lose their sense of time and enjoy an intense satisfaction and immediate feedback. Losing one's sense of time means, in musical terms, moving away from physical time (or objectively clock-measured time), towards the subjective experience of musical time.

Lori Custodero, a researcher on music education among pre-school children, found that flow is a major factor in the way young children relate to music. She highlights the following elements, relevant to musical activity:

- high levels of concentration;
- a merging of action and awareness;
- a loss of self-consciousness;
- a sense of clear goals and reception of immediate feedback; and
- a sense of feeling both highly challenged and highly capable. (Custodero 1999)

While it is largely agreed that emotional expression is a strong motivation for being involved in a musical activity, it seems to me that the same is true when it comes to a state of flow. Emotional expression is in fact related to flow, and what we call 'inspiration' in the context of performance is also linked to this particular state of feeling able to progress in real-time without interruption.



More recent observations

Since 2010, the Guildhall School of Music & Drama (John Sloboda, David Dolan and groups of students led by David) together with Imperial College (a team led by Henrik J Jensen) have been collaborating in a research project studying several aspects of improvisation in music performance and its impact on the musicians, their audiences and the relations between them. In a publication dated September 2018, we refer to the existence of an Improvisation State of Mind that seems to emerge from our research. In this work, we compared between improvised and “standard” approaches to performances of the same repertoire work, comparisons which hitherto could only be inferred from impressionistic historical accounts. This study takes an interdisciplinary multi-method approach to discovering the contrasting nature and effects of prepared and improvised approaches during live chamber-music concert performances of a movement from Franz Schubert’s “Shepherd on the Rock,” given by a professional trio, in the presence of an invited audience with varying levels of musical experience and training. The improvised performances were found to differ systematically from prepared performances in their timing, dynamic, and timbral features as well as in the degree of risk-taking and “mind reading” between performers, which included moments of spontaneously exchanging extemporised notes. While the “standard” performances were more accurate in terms of short-term beats, the riskier performances had a higher level of coherence in long-term phrasing. In other words, the ensemble was much “more together”. Post-performance critical reflection by the performers characterised distinct mental states underlying the two modes of performance. The amount of overall body movements was reduced in the improvised performances, which showed less uncoordinated movements between performers when compared to the prepared performance. Audience members, who were told only that the two performances would be different, but not how, rated the improvised version as more emotionally compelling and musically convincing than the prepared version. The size of this effect was not affected by whether or not the audience could see the performers, or by levels of musical training. EEG measurements from 19 scalp locations showed higher levels of Lempel-Ziv complexity (associated with awareness and alertness) in the improvised version in both performers and audience.

Why improvising?

The presence of spontaneous flow, a universal element in human behaviour that lies at the heart of creativity in general and improvisation in particular, is one answer to the question. Encouraging and developing the ability to extemporise can help to achieve a state of flow, together with the ability to make creative use of knowledge in real time.

Another answer is that the level of active listening and involvement in which musicians engage when extemporising was found to be higher than in other forms of musical activity where improvisational quality is absent (Kenny and Gellrich 2002; Dolan, Sloboda, Jensen, 2013 & 2018). The sense of this higher level of involvement can later be applied to the performance of pre-composed music.

The experience of extemporisation includes the listener as well, who occupies the other end of what we might call the line of communication from the creator or performer (who are obviously not necessarily the same in pre-composed music). The relationship between extemporisers and listeners (depending upon cultural codes) plays an important role in the process. The element of risk-taking, present in any extemporised situation, is a strong stimulant to active listening, vital in order for a state of flow to exist and for an interactive chain of communication to work successfully. All the elements important in solo improvisation take on greatly increased importance in group improvisation: in such situations, the level of active listening between the musicians themselves, and between the musicians and their audience, becomes heightened. The flexibility and the higher than normal level of risk involved in chamber-group improvisation can often intensify the experience. When transferring these qualities to the performance of pre-composed chamber music, a sense of ‘one-time experience’ can be achieved. As if the “How” joins the “What”.

Could this ring a bell when it comes to living one’s life?

David Dolan

Roger Kneebone’s podcast *Countercurrent* is at <http://apple.co/2n5ROy1>



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