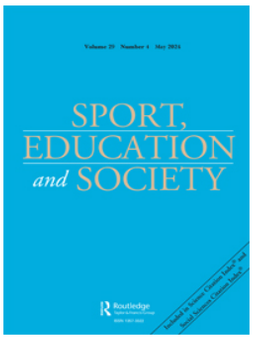
On making one's way through chess



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On making one's way through chess

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ABSTRACT

This paper explores the relation between thinking and making in the context of chess. Historically, this relation has been examined through an intellectualist tradition, which reduces chess to a series of calculations, connected up and isolated to the mind of a master. Here, we speak to this tradition through the voice of a theorist, and suggest it is to put thinking ahead of making. What, though, if this relation was re-imagined? What if master chess players did their thinking, not before a move was made, but in the midst of its making? In response to these questions, we explore the conditions and potentials of chess spoken through the voice of a craftsperson. To do so, chess is first grounded, not intellectually, but ecologically. Then, weaving in Tim Ingold's perspectives of making, we propose that the unfolding form of a game is attributed, not to the computations of a detached master, but to the attentive responsiveness of players attuned to the ebb and flow of a game, anticipating a way forward by looking, along with listening and feeling. This is to put thinking, not ahead of making, but in its midst. We round out by considering the attentive, corresponsive and temporal characteristics of chess situated as a crafted endeavour.

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1. Introduction

'We cannot make the future', declared anthropologist Tim Ingold (2013, p. 6), 'without also thinking it. What then is the relation between thinking and making?' This is an interesting question, with its profundity residing at whom it is directed. Asked of a theorist, for example, and one may get a different answer to that when asked of a craftsperson. To the theorist, Ingold (2013) suggests, thought is likely to precede that which is made, which is to imply that making is a sequentially mechanical process of application and imposition. The material form of an artefact is the result of an imprinted thought established *a priori*. To the craftsperson, in contrast, form arises not from the application and imposition of preceding thought, but from the crucible of a skilled practical engagement with the beings and things that surround them (Adamson, 2007; Dormer, 1994; Ingold, 2013). It is not a product of imposing onto, but a process of *joining with*. The difference between the theorist and craftsperson, then, lies not in the presumption that the former only thinks and the latter only makes, but that former makes through thinking, while the latter thinks through making.

We follow the implications of these respective threads – of the theorist and craftsperson – grounded in the context of chess. Signposted here, our paper starts from the premise that chess is a game players *make their way through*. What, then, is the relation between thinking and

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making? We respond to this question across two main sections. In the first, we follow Ingold (2013) and address it through the voice of a *theorist*. Viewed as a static, close-ended puzzle with a delineated start and end, the form of game-play is seen to arise from (superior) computations that go on in the mind of the master player. It is to follow a mentalist approach to game-play grounded in the tradition of *intellectualism* (Heft, 2013). This particular form of inquiry adopts an analytically detached stance toward a subject matter (Heft, 2013, p. 267), reducing chess to a series of computations, connected up and isolated to the mind of a master player. It is to put thinking *ahead of* making, which is to say the theorist-chess-player, *makes through thinking*.

In section two, we contrast this established view by exploring the game of chess through the voice of a *craftsperson*. Following Sennett (2008), craftspersonship is viewed here as a skilled practical engagement with the beings and things that are of concern to us. Repositioned from its intellectualist roots, we move chess toward more ecological grounding. Specifically, we situate chess in tenets of Gibson's (1979/2014) ecological approach to psychology, and Ingold's (2013) perspectives of making. This holds that the unfolding form of a game is attributed, not to the computations of a detached master player imposing onto, but to the skilfully attuned responsiveness of players who join with the games coming-into-being, anticipating a way forward by looking, along with listening and feeling (also see Sennett, 2008). This is to put thinking, not ahead of making, but in its midst. The craftsperson-chess-player, *thinks through making*. We round out by exploring the attentive, corresponsive and temporal character of chess viewed as a crafted endeavour that carries on through the experiences players cast out in the midst of making.

2. In the voice of a theorist

Pragmatically, chess is played on a board that constitutes sixty-four isomorphic squares arranged in an 8×8 configuration, with a total of thirty-two pieces equally divided between two colours (black and white). The pieces are classified into six classes – 'pawn', 'rook', 'knight', 'bishop', 'queen' and 'king' – each of which yielding its own set of movement possibilities. This means that pieces must be collectively mobilised in a coordinated way to 'checkmate' (i.e. defeat) one's opponent. Moreover, as the movement possibility of each piece is inherently constrained, the configuration of pieces has a limited number of possibilities. Considering these basic formal elements, a chess game could be conceived as a well-defined task,[1] constituted by a closed totality of pre-established combinatorial possibilities (Gobet, 2019; Gobet & Charness, 2018). Albeit broad, this perspective bodes with a view of chess as a close-ended puzzle, in which the solution is already at the heart of the problem. Taking this as our basis, we speak to such a view through the *voice of a theorist*.

2.1. An intellectual tradition

A chess game spoken through such a voice has some important characterisations. First, it is to ground game-play in an *intellectualist* tradition (Heft, 2013). By this, we mean adopting a detached, dispassionate position, whereby one is removed from that which is of interest in order to empirically generate an objective, analytic and mechanistic description of its goings on. It follows the vertical ontology that van Dijk and Withagen (2014) critique, whereby reality is sought in layers hidden beneath what is apparent and observable. To explain a phenomenon in accord with this vertical ontology, one must search for casual mechanisms located somewhere beneath its goings on. Thus, it is a positionality that oft-privileges an 'intellectual's' vantage; located atop of the phenomenon that is occurring at ground level (see Woods et al., 2023). The prototypes for intellectualism in post-Renaissance thought are the likes of Bacon and Descartes, with much 'modern' philosophy following this tradition (Heft, 2013; Reed, 1996b).

Indeed, while intellectualism has proven both dominant and (at times) fruitful for empirical investigations of the natural world, it has fostered deep and oft-unchallenged assumptions implicit to how scholars approach their primary subject matter (Heft, 2013; Reed, 1996b). In the field of

cognitive science, for example, the ripples of intellectualism can be detected through a pervasive unit of analysis scaled to the internal, mental capacities of animals. Coupled with a vertical ontology, this has led to the (still dominant) postulation of underlying cognitive mechanisms believed to primarily regulate the control and coordination of an animals observed behaviour (cf. Araújo & Davids, 2011; Chemero, 2009). Following suit, this has elicited the contention in psychological science that explanations of phenomena require the explication of underlying mechanisms, leading to a dominant tendency in which human experience is explained as a product of neural activity. This has imbued an objectification of mental states, manifest in the presumption that we *have* thoughts; we *have* memories; we *have* sensations (van Dijk & Withagen, 2014).

Not only is an intellectualist tradition noted in cognitive and psychological science, it can be also can be felt in the fields of art, architecture and archaeology. It is particularly evident through a common conception of 'form', oft-understood as the imposition of preceding thought onto inert matter (Ingold, 2013). Reflected in what Ingold (2013) refers to as the hylomorphic model *(hlyo* meaning 'matter', *morphic* meaning 'form'), the creative process of making is typically traced, not to the skilfully attentive responsiveness of a craftsperson attuned to the ebb and flow of the material they work with, but to an internalised representation established *prior* to an object being made (also see Barber et al., 2019; Woods & Davids, 2022). It is to start:

> […] with an idea in mind, of what we want to achieve, and with a supply of the raw material needed to achieve it. And it is to finish at the moment when the material has taken on the intended form. (Ingold, 2013, p. 20)

In summary, to speak in the voice of a theorist and follow an intellectualist tradition is to focus one's empirical investigation not on observed action, but on the mental structures presumed to *underlie* it. We next explore how such a tradition has shaped (and continues to shape) empirical investigations in the context of chess.

2.2. An intellectual game

Given its elementary formal organisational properties, the empirical study of chess has been inherently grounded in the intellectualist tradition. Introduced through cognitive science (see Binet, 1894/1984; Cleveland, 1907; Von Neumann & Morgenstern, 1944/1966; de Groot, 1965/1978; Chase & Simon, 1973), chess has historically been looked upon as a privileged locus for investigating cognitive structures purported to underlie dispositions such as memory, pattern recall and recognition, and decision-making. It is believed that such empirical work could lead cognitive science to unravel the 'mystery' behind (or *beneath*) chess mastery. Generally, the modus operandi for empirical investigation has been to compare the performance of experienced and novice players undertaking various problem-solving tasks. Despite variations, empirical problem-solving tasks in chess are essentially simple in both nature and design: the player is placed in front of a chessboard with a particular positional configuration of pieces and given the task of making the best sequence of moves to achieve a certain, pre-determined outcome (e.g. checkmate in 'n' moves, or a forced draw from an unfavourable position). After this, the interlocutor is asked to verbally justify their choices, following what de Groot (1965/1978) called 'verbal protocols'. Memory tests, in a similar vein, typically assign the interlocutor the task of reconstructing, as perfectly as possible, a positional configuration that has been presented to them for '*n*' seconds.

Dutch psychologist Adriaan de Groot was one of the pioneers in applying such empirical tests and systematizing the results, making his work among the classics of cognitive science literature on chess. Noting the significant disparity in mnemonic reconstruction performance between players of different levels, as well as in attentional regimens during problem-solving tests, de Groot concluded that while novices perceive positional configurations in terms of individual pieces, experienced players typically perceive them in terms of a set. For example, unlike the novice who usually anchors attention on a 'bishop', 'knight' or 'rook' in the face of an imminent situation, a chess master anchors attention on the bishop-knight-rook relationship, relative to the current

make-up of the board. 'The master's experience', writes de Groot (1965/1978, p. 329), is what enables them 'to quickly "integrate" the picture of the position and through this to imprint and retain it within a very short period'. This holds that the recurrence of a certain position for the player's perception is directly proportional to its significance and is, therefore, memorised. So writes de Groot (1965/1978, p. 3, emphasis added):

> It is only because the position is meaningful to the master, is a unity, a well-structured scene of battle, that he is able to *keep it in mind*.

The above referral to 'keep it in mind' quite clearly reflects the intellectualist tradition that de Groot's work carried on in the context of chess. In accord with the crux of this tradition – and in speaking to the vertical ontology van Dijk and Withagen (2014) illuminate – what de Groot postulated a master player 'kept in mind' was a 'schematic anticipation'[2] that guided prospective moves in response to the occurrence of significant patterns in play, such as the Queen's Gambit. Broadly defined, these abstract schemes are images endowed with a certain set of central characteristics, believed to enable master players to selectively respond to the turbulence of the chess game in its unfolding. Anticipation, in this sense, is akin to prediction (cf. Ingold, 2013), where the uncertainty of a future outcome is reduced by way of computation, resulting in the constructed scheme guiding a prospective move. Despite their presumed responsive character, these schemes harbour the germ of transitivity, implying a two-stage creation cycle: materialisation (of ideas into positional configurations) and dematerialisation (of positions on the board). In other words, it is to start with a scheme constructed in the mind of the player, and end with its imposition on the board. This, we suggest, puts thinking *ahead of* making.

Along these lines, the quintessence of chess expertise, de Groot (1965/1978) explained, lies precisely in the mental 'accumulation' of dispositions ('experiential linkings') that foster a mental chess game of exceptional scope and quality. This creates a backward reading of chess mastery, viewed as something that occurs in the past by 'building up' and storing a highly differentiated system of mental dispositions. Further, by putting thinking ahead of making, this intellectualist perspective of chess, accompanied by an additive, cumulative principle, reflects what Ingold (2011, p. 68) refers to as the 'logic of inversion'. It stands that when patterns are to be explained, there is an implicit assumption that such patterns already existed (in this case, in the mind of the master player), albeit in an abstract form. This inversive logic has been undeniably dominant in studies of chess psychology throughout the twentieth century, which in turn, has been associated with developments in Artificial Intelligence.

Inspired by the work of de Groot, psychologists Herbert Simon and William Chase published a trilogy of works in 1973 that made up the publication, *Perception in Chess*. Essentially concerned with the same issues as de Groot, echoing its intellectualist grounding, this work promoted what Simon and Chase called 'chunking theory'. Perhaps the first systematized theory of perception in chess, chunking theory (while criticised) established an enormous influence on studies in chess, reflected still to this day. Without devoting too much time to the nuances of its empirical foundation, for the purposes of our thesis it is enough to point out that one of Simon and Chase's main conclusions was that long-term memory is coded in the form of 'perceptual chunks'. Like de Groot's schematics, perceptual chunks are thought to be mental schemes that represent the configurations of chess pieces, and provide easily accessible categories in the exercise of recalling the records in short and long-term memory. It holds that the more one experiences aspects of practice, the more they are able to 'chunk' relevant features together in what Gobet (2019) refers to as perceptual units. Such perceptual units are believed to provide individuals with a near immediate understanding of the situation, and thus ultimately instructs the body about what to do as a situation unfolds (cf. Withagen & van der Kamp, 2018).

Indeed, while there has been much work on chess in cognitive science since these classic foundational theories, much still (implicitly) follows an intellectualist tradition through its assumption that skill is primarily dependent on the number of positional schemas, templates, or representations one

is able to develop, store, recognise and retrieve when the time is 'right' (see Bilalic et al., 2007). Montero and Evans (2011), for example, situate the importance of chunk accumulation in chess expertise, leading to their suggestion that 'chess is *not* a bodily skill' (p. 184, emphasis added). Quite clearly, this speaks to the dematerialisation of chess grounded intellectually. What's more, even when directly opposed to 'pattern recognition theory', competing theories in cognitive science of chess are still typically grounded in intellectualism. One such example is the 'SEEK' model, proposed by psychologist Dennis Holding (1992). It presumes that chess skill does not lie in cognitive mechanisms related to the accumulation and application of chunks or templates *per se*, but in underlying analytical and predictive processes. While not explicitly schematic or representational, such a view is still firmly intellectualist, not only though its analytical connotations, but through its presumption that thinking occurs *before* action. This imbues a view of chess skill as disembodied, reduced to a strictly computational activity, in which moves are analytic and discrete. Moreover, it fosters the presumption that games have a defined beginning (of thought in mind), and end (of imposition on board).

We can, thus, surmise that chess spoken in the voice of a theorist through an intellectualist tradition is a game in which thinking is put *ahead of* making. What, though, if this relation was re-imagined? What if master chess players did their thinking, not before a move was made, *but in the midst of its making*? Moreover, what if true skill resided, not in the head, but in a player's sensitivity to the unfolding ecology of which they are apart – learning to notice and carefully respond to things? It is these questions that seed the forthcoming discussion.

3. Toward a different voice

Despite its dominance, the intellectual tradition in cognitive and psychological science has not been without criticism (see Chemero, 2009; Costall, 2015; Glâveanu, 2014; Heft, 2012; Malafouris, 2013; Reed, 1996b). Generally, this criticism has targeted the detached and disembodied character of intellectualism, drawing sharp focus on the presumed analytical and mediated relationship individuals sustain with the environment and its constituents. Following this criticism, we suggest that to play chess in the intellectual voice of a theorist is to reduce it to a rational sequence of virtual calculation that goes on in the mind of the player *before* a move is made. This strips the game of all its opacity – its light and shadow, creativity and improvisation, temporality and texture – fostering a view of game-play, not as a relationally attentive process stretched between multiple actors, places and times, but as a discrete, individualistic product hidden beneath layers of observable action.

Critiquing along similar lines in the fields of art, archaeology and architecture, Ingold (2013) writes:

> The drawing is not the visible shadow of a mental event; *it is a process of thinking, not the projection of thought*. (p. 128)

Following this sentiment, we move toward a conceptualisation of chess that is spoken, not through the intellectual voice of a theorist, but through a *responsive voice of a craftsperson*. This situates the player in the midst of a games coming-into-being, working *with*, not imposing onto its material features. Thus, our forthcoming thesis holds that making one's way through chess is not the projection of superior thought, but *a process of thinking*.[3] Prior to progressing on, however, it should be noted that we are talking about skill in a broad sense, seeking to escape from the reductionism of the concept as mobilised by intellectualist agendas. In this case, our aim is to expose the prerogatives and consequences of *both* voices – the theorist and craftsperson – to provide means for reading chess playing in a more embedded, 'experience near' way (Geertz, 1973).

3.1. Finding alternate grounding

We start by departing the intellectualist tradition, moving away from the (still) dominant (computational) account of behaviour germane to mainstream cognitive and psychological science. To

do so, we draw on the ecological approach to psychology initiated by James Gibson in the 1960s and 1970s. In its radical departure from the intellectually mentalist tradition, Gibson's ecological approach directs attention toward the nature of perceiving, broadly denoted through three major tenets (see Chemero, 2009). First, it argues that perception is a *directly active* process. To say that perception is 'direct' is to say that it does not involve internal representation; it is not computational (Gibson, 1979/2014). The skilled practitioner, as Ingold (2000, p. 164) puts it, 'consults the world, rather than representations (rules, propositions, beliefs) inside his or her head, for guidance on what to do next'. In this vein, perception is an *achievement* of an organism keeping-in-touch with the world; it is not a mental act nor an act of the body, but an act of a living observer making their way through the environment (Gibson, 1979/2014, p. 228). This means that 'active' does not describe a mentally sequential process of predicting, inferring or representing, but quite literally refers to movement (of eyes, head, torso and body). In speaking to this account of perception, philosopher Alva Noë (2015) writes:

> The scientist's [theorist's] conception is impoverished, and it gets in the way of our appreciating that it is not brains that perceive, but active animals or people. Seeing […] is more like climbing a tree, or reading a book, than it is digesting what you've eaten. (p. xii, text in bracket added)

In less metaphoric prose, as a living observer moves about, they directly pick-up invariant information in an ambient array that specifies an environments layout in relation to their path of observation (Gibson, 1979/2014). Movement produces a changing array of stimulation, which makes invariant information specific to environmental features easier to pick-up (E.J. Gibson, 1988). There is, then, no need to represent or reconstruct the world in the mind; it is directly accessible to an active perceiver tuned into the pick-up of specifying information.

This leads to the second major tenet of the ecological approach: perception not only guides action*, but action reciprocally guides perception* (Gibson, 1979/2014; also see Chemero, 2009; Heft, 2012; Reed, 1996a). On this very point, Ingold (2000, p. 166, emphasis added) suggests that 'if perception entails movement, then it must be a mode of action *rather than a prerequisite for action*'. This is in radical opposition to the intellectualist tradition, where perception and action are separated. In the ecological approach, they are not separable functions, but constitute a jointly operative *perceptual system* (Gibson, 1966). It is why, in returning to Noë's sentiment, perception is akin to climbing a tree or reading a book – it is something animals *do*. In his last book, *The Ecological Approach to Visual Perception*, Gibson argues this, stating that action is controlled:

> […] not by the brain, but by information, that is, by seeing oneself in the world. Control lies in the *animal-environment system*. Control is by the animal *in* its world, the animal itself having subsystems for perceiving the environment and concurrently for getting about in it. (1979/2014, p. 215, emphasis added and in original)

There is an important corollary to these first two tenets, which is that if perception is direct and also guides action (and vice versa), then the environment must have sufficient information to specify opportunities to act. This leads to the third major tenet of the ecological approach, Gibson's (1979/2014) concept of *affordance*. Generally speaking, an affordance is a psychological property of the environment that is taken with reference to an animal's action capabilities.[4] As Gibson states:

> The *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill. The verb *to afford* is found in the dictionary, but the noun *affordance* is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no other existing term does. It implies the complementarity of the animal and the environment. (1979/2014, p. 119)

To a human, for example, a doorway may afford walking through, a stairwell may afford climbing up or down, and a chess piece may afford positioning in such a way so as to 'checkmate' an opponent. In accord with the first two tenets, how one perceives such affordances is not by constructing sense data according to some conceptual schemata, but by tuning into salient information that is all around us. This means that skilful practitioners of all kinds – be that of walking through doors, climbing stairwells or even playing chess – are more sensitive (i.e. attuned) to the pick-up of information

that directly specifies affordances supportive of goal-directed behaviour. That is, *they notice changes in environing conditions, which directs their doings and makings*. Learning to perceive affordances in the skilled unfolding of a task is a practiced ability of noticing and responding to features of an environment that may go unnoticed by others; a process Gibson (1979/2014) referred to as an 'education of attention'.

An important aspect of the affordance concept is that it offers a unique perspective to the philosophic notions of 'value' and 'meaning'. In the intellectualist tradition, the environment is oft-looked at in atomistical terms, as matter in motion, with 'meaning' having to be attached to its features through some internal, perceptual process from a static and also atomistic observer (i.e. Neisser, 1967). However, given that in the ecological approach the environment consists of affordances – that is, opportunities for action – 'meaning' does not have to be attached, but can be discovered in the midst of exploratory action by an *ecstatic* and, let's say, *holistic* observer. So says Gibson (1972/2020, p. 410):

> The meaning or value of anything consists of what it affords an observer … But what it affords the observer is determined by its material substance and its shape, size, rigidity, motion, etc. *What it means and what it is are not separate, as we have been led to believe*. (emphasis in original)

This, importantly, situates 'meaning' in the ecology of animals rather than in the inner mental realm. Moreover, it highlights a critical distinction with the intellectualist tradition common to empirical investigations of chess. Namely, as was noted in de Groot's earlier suggestion that meaningful chess positions are 'kept in mind', an intellectualist position would hold that 'meaning' is added onto or bestowed upon the chessboard by a master player once a pattern or sequence has been *recognised*. Comparatively, in accord with the ecological approach, 'meaning' would not be pinned onto the board following recognition, but be discovered in the midst of playing, based on the game's affordances. Master players, in other words, would not be those who are able to match patterns on the board with representations constructed, memorised and stored in the mind, but be those who are more attentively responsive to the affordances that unfold in the midst of making their way through a game. This holds that master chess players would not know *more* (by way of schematic representation accumulated in the mind), but know *better* (by way of attuned perceptual systems resonate with specifying information).

To surmise, Gibsonian psychology fosters an appreciation that goal-directed behaviour need not be reduced to, nor explained by way of, motor programmes, schemes, representations or computations that reside in the head (also see Fajen, 2007; Heft, 2001; Kugler & Turvey, 1987; Reed, 1996a; Warren, 2006). In this sense, it offers a non-intellectualist account of behaviour, understood as an emergent phenomenon resulting from *interactions* sustained between an animal and environment. As Warren (2006, p. 362) states, a pattern of behaviour 'does not reside a priori in the individual components of the system but is a consequence of their interdependence and interaction'. Considered in the context of chess, we suggest that mastery resides, not in the head, but in the attunement of one's perceptual system resonate with information specifying the coming-into-being of a game's affordances. To help us explore this further, we now draw on Ingold's (2013) perspectives of making, which encourages us to speak of chess, not through the voice of a theorist, but through that of a *craftsperson*.

4. In the voice of a craftsperson

Recall earlier, where we spoke of how the ripples of intellectualism can be detected not only in the cognitive and psychological sciences, but in art, architecture and archaeology. This, it was suggested, manifests through a common conception of 'form', viewed as the imposition of preceding thought onto inert matter, reflecting what Ingold (2013) refers to as the hylomorphic model. It holds that the form of things, like clay pots, stone axes and even cathedrals, are the result of representations established in the mind of the maker *before* such things are made. In his exceptional book *Making*, Ingold

(2013) argues against this tradition in favour of an approach resonate with the ecological grounding covered above:

> I want to think of making … as a *process of growth*. This is to place the maker from the outset as a participant *in amongst* a world of *active materials*. These materials are what he has to work *with*, and in the process of making he 'joins forces' with them, bringing them together or splitting them apart, synthesising and distilling, *in anticipation of what might emerge*. (p. 21, emphasis in original and added)

This excerpt is profound and requires elaboration. First, as is noted through its ontogenetic referral, Ingold foregrounds the import of process in the context of making. As a corollary, this imbues a view of 'form' as perpetually unfinished, changing with the unfolding of a world in flux (Rietveld, 2022). This is to speak, not of things as created or made, as if their final form was contained in the mind of a practitioner waiting to be imposed onto passive material. But is to speak of things perpetually *in-creating*; not created, *but crescent*, not made, *but making*. Indeed, this does not discount the role of planning in the context of making, but rather repositions it from that which occurs prior to the process of making, to that which unfolds in its midst. On speaking to the experiential qualities of making, Dewey (1934/2005, p. 54) suggests that the aesthetic quality of medieval cathedrals relates in part to the fact that their constructions were not so much controlled by plans and specifications made in advance, but that *plans grew as builds grew*. This is to view the process of making as one of unfolding along temporal lines of growth that extend out, following a directionality that flows not vertically (plan-imposition), but longitudinally (grow-with). Thus, the ontogeny of making emphasised in Ingold's perspectives is open-ended, stretching out into a world in motion.

To this point, Ingold's perspectives do not separate the practitioner from the materials in which they craft their trade; a logic germane to the intellectual tradition. Rather, as is noted in the excerpt above, they are situated in amongst the materials they work *with*. This leads to the second aspect of making highlighted here: materials are active participants that contribute to the very process of making. As Deleuze and Guattari (2004, p. 451) suggest, whenever we encounter material, it is 'in movement, in flux, in variation'. Material, in other words, is an active participant that calls for attentive response. This is precisely why Ingold draws reference to the need for practitioners to 'join forces' with materials. For in doing so, they are able to find an opening and follow its grain, moving along with the material by looking, listening and feeling. Practitioners and materials, in other words, enter into a *correspondence*:

> […] the potter's feeling flows in and out in a *correspondence with the clay*, the herdsman's in correspondence with the airborne rope, the [kite] flyer's running with the wind, and the cellist's bowing with musical sound … It is to mix the movements of one's own sentience with the flows and currents of animate life … Such mixture … *is of the essence of making*. (Ingold, 2013, p. 108, text in brackets and emphasis added)

Indeed, correspondence does not preclude practitioners from engaging in foresight. It is a kind of foresight, however, that does not lie in a cogitation that comes *before* sight. Rather, it is the very activity of *looking ahead*, not to preconceive what is to occur, but to *anticipate* what might emerge (Ingold, 2013). This brings us to the third aspect of making: the role of anticipation. As is common in the intellectualist tradition, especially in the context of chess, anticipation is akin to prediction or representation, viewed as a computational activity that reduces the uncertainty of future events. Though, in the perspectives of making explored here, anticipation need not be conflated with prediction or representation. Following Derrida (1993), Ingold suggests that to anticipate is to be out in front; to take the lead. It is a matter:

> […] not of predetermining the final forms of things and all the steps needed to get there, but of opening up a path and improvising a passage. To foresee … is to see *into* the future, not to project a future state of affairs in the present; it is to look where you are going, not to fix an end point. (Ingold, 2013, p. 69)

In a compelling piece that speaks to such a view of anticipation, van Dijk and Rietveld (2021) suggest that affordances have a temporal character. For example, building a house, installing an art exhibition, or even making one's way through a chess game are large-scale affordances that have a direction of unfolding. A

skilled practitioner with an extended history of participating in these respective contexts can anticipate what may emerge, and their subsequent direction of travel, not because they project foresight of form onto the passive materiality of the present. But because they have acquired the responsiveness needed to attune to smaller-scale affordances, which in their actualisation, holds open a larger-scaled direction of travel (also see Nonaka et al., 2010; van Dijk & Withagen, 2016). Psychologists Hofsten and Lee (1985) refer to this phenomenon as *prospective control*, and suggest that as all observation is an active search for information that takes place in a complex environment, it has a 'will-lead-to-ness' character about it (also see Reed, 1996b). This means that one does not have to predict or represent all of the steps in advance of their traversal. Nor do they even need to start with a concretised end-in-mind through which they work toward. Rather, all that is required to anticipate where one is going is an openness to the possibility of the unfolding process to which they contribute (Rietveld, 2022; van Dijk & Rietveld, 2021; Woods & Davids, 2023).

Woven together, these elaborations suggest that for a craftsperson, thinking does not precede that which is made, but *unfolds in the very midst of making*. In other words, skilled craftspeople of all trades, *think through making*. Taking this as our basis, we now explore chess as a game in which players *make their way through*, drawing on the attentive, corresponsive and temporal connotations of making discussed here. Doing so encourages a view of chess, not as an intellectual conquest of strictly mental prowess, but as a crafted endeavour that flows along, moving in attentive response to ongoing changes in environing conditions.

4.1. A game of attention

> Knowing is not about prediction and control but about remaining *attentive to the unknown knocking at the door*. (Deleuze, 1989, p. 193, emphasis added)

Earlier, we spoke of how learning to perceive affordances in the skilled unfolding of a task is to undergo what Gibson (1979/2014) referred to as an education of attention. For Gibson, this is a process of 'tuning-in' to information that specifies what things in our surround afford, be that in hinderance or furtherance of activity. It is, in a word, a process of *attunement*. Critically, this process does not reach a point of conclusion, but it carries on for as far as one wishes to attend to that which is of interest (Gibson, 1979/2014; also see Reed, 1996b). This perpetuality holds that in the practice of any craft, skill lies in one's sensitivity to subtle variations in environing conditions (of which they are a part) that are always going on.

Considered in the context of chess, we could speak of a master as one who is attuned to information specifying moves available to both them and their opponent. This would mean that as one finds their way through a game, what guides the prospective making of a move is not a constructed representation, but a finely tuned sensitivity to the affordances available at any particular moment. As discussed earlier, this does not preclude the role of anticipation, but is to speak of it as a means of holding open (or closing) larger-scaled affordances determined through the perception and actualisation of smaller-scaled affordances. An attuned master chess player making their way through a game would, then, be able to anticipate the unfolding direction of travel (i.e. hold open a larger-scaled affordance) by carefully perceiving and actualising smaller-scaled affordances.

Paradoxically, however, the notion of attunement places much of the focus on the side of the perceiver, which risks imbuing a static view of the environment, seen to be already there, waiting simply to be perceived (Ingold, 2017). As a chess master may attest, skill resides not only in a sensitivity to specifying information 'there', but also in a propitious forbearance, waiting on an opponent to respond to affordances that come-into-being. For it is in this response where a master chess player may have to alter course, and attend to newly generated information specifying affordances that come into and out of being. Appreciating this, Masschelein (2010) offers a different reading of 'attention', albeit complementary to that put forward by Gibson. Specifically, to Masschelein, attention is not a process of attunement, but *exposure*; a process in which one displaces their view. The

purpose of this displacement is not to reach an all-knowing vantage, but to 'see things from a different perspective'. This 'seeing from a different perspective' requires individuals to wait on the world to revel itself, and respond to such revelation with care and sensitivity (Ingold, 2017).

In bringing together Gibson and Masschelein, we can speak of attention as having two sides: *attunement* and *exposure*. Which of them, though, comes first? Well, to us at least, to make one's way through a chess game – like any venture in life – is to step out into a world unsettled, and to put oneself at risk of what may transpire. But it is in this risk where true skill – true chess mastery – is born, for *we can only attune to that which we are exposed*. Thus, spoken through the voice of a craftsperson, chess mastery is not about seeking to impose moves upon a board by way of preceding thought. Rather, as suggested by Deleuze in the quote with which this section began, it is about submitting to the risks of exposure, and masterfully tuning-in to the opportunities afforded.

4.2. A game of correspondence

> To correspond with the world … is not to describe it, or to represent it, but to *answer to it*. (Ingold, 2013, p. 108)

In accord with Ingold's perspectives of making, material is not a passive recipient of preceding thought. It is an active participant that contributes to the very process of making. Practitioners and materials, thus, respond to one another; they *correspond*. Central to the notion of correspondence is an ability to respond and be responded to – a *response-ability*. Like Ingold (2017), we borrow this phrase from composer-theorist John Cage. In a wonderful lecture titled *Experimental Music*, Cage (2011) explains that in order to truly listen to music, one needs to give up 'the desire to control sound' and 'set about discovering means to let sounds be themselves' (p. 10). This renders listening a primarily phenomenal experience, in which one learns to *feel* the tone, frequency and amplitude of sound (Cage, 2011). Feeling, in this sense, is not haptic, but experiential; an opening up in which one moves and is moved by what they *hear*.

Given its centrality to Ingold's perspectives of making, we now discuss how the notion of correspondence could enrich our understanding of chess situated as a crafted endeavour across two points. First, it holds that the 'form' of game-play would unfold in response to that which is cast out by players and the pieces (materials) in which they work with. In other words, the form of a chess game – much like that of a clay pot, a knitted garment, or a drawn line – would not be the output of a complete and predetermined thought housed to the mind of a craftsperson waiting simply to be imposed onto inert material by a passive body. Rather, it would be a phenomenon that emerges as players cast experiences out:

> […] in ways they can answer to the experiences of others, and they likewise, so as to achieve a *correspondence* that goes *beyond* what any of them could have imagined at the outset, and that in turn allows them to *carry on* their lives together. (Ingold, 2017, p. 38)

This leads to our second point. In response, we are qualitatively different than before; we are 'ourselves in encounter with another' (Tsing, 2015, p. 46). This means that in response, we are transformed in a somewhat unpredictable way. And it is the transformational quality of correspondence that foregrounds a temporality transcendent of supposed ends or conclusions. Like echoed by Ingold in the quote with which this section began, correspondence is about answering to the ebbs and flows of a world in flux, which in doing so, turns ends into new beginnings, leveraging new opportunities to carry on. Understood as a game of correspondence, chess as a crafted endeavour would thus not have a delineated start or end, but would carry on through the experiences players cast out in the midst of making. It is on this temporal character that we now direct our attention.

4.3. A game that carries on

> […] duration is not merely one instant replacing another; if it were, there would never be anything but present – no prolonging of the past in the actual … Duration is the continuous progress of the past which gnaws into the future and which swells as it advances. (Bergson, 1911, pp. 4–5)

Recall earlier, during our excursus of the intellectualist tradition, where we mentioned that chess spoken in the voice of a theorist could be considered a simple system, in which the solution is already at the heart of the problem. The moves one could make are pre-determined in accord with the combination of the pieces left in-play. This perspective imbues a temporality that is close-ended, whereby the game narrows down as moves are imposed onto the board. Games, and the moves therein, could thus be thought of as discrete instances, which in their connecting up, leads toward a point of conclusion as the game draws to a close. Though, if we are to consider chess as an ecological phenom, this close-ended-ness will not suffice. Not only does it strip the game of all its opacity, it renders the players – and the materials they join – static, divorced from a world that is crescent and always on the move. Ingold's perspectives of making, after all, not only position materials as active participants, but they situate the craftsperson within an unfolding ecology of relations. How, then, are we to consider the temporality of chess as an ecologically crafted endeavour that goes on in a world of flux?

In searching for a way through this question, we found inspiration in the third chapter of John Dewey's seminal text, *Art as Experience*. Speaking on what it means to have an experience, Dewey explores the relation between doing and undergoing. In life, Dewey acknowledged, people do all kinds of things. One may, for example, play a chess game in the park, then converse with a friend who recently returned from a study trip to Australia, then catch a bus to a university to attend a research seminar. In each of these things there is a degree of certainty to be achieved – the person knows they are playing chess, they know they are talking with a friend and they know they need to catch a bus by a certain time in order to attend the seminar. Yet there is also an experience undergone – the person is changed slightly, perhaps even transformed, by engaging in the doing of each activity. This, according to Dewey, is because in experience:

> […] flow is from something to something. As one part leads into another and as one part carries on what went before, each gains distinctness in itself. The enduring whole is diversified by successive phases that are emphases of its varied colors. (1934/2005, p. 38)

Otherwise stated, whatever is done takes into itself something of the experience of that which was done before, and in turn, is carried into that which is done next. This holds that the succession of each 'doing' is punctuated by the 'coloured' intervals in-between cessation and inchoation, which is why Dewey compares experiencing to that of breathing; it is a rhythm of in-takings and out-givings.[5]

Considering these perspectives, let us now briefly revisit our above example, starting from the premise that the person playing chess in the park happened to lose this particular game. Frustrated, the person carries the feeling of annoyance born through the lost chess game into the conversation with their friend who recently returned from a study trip to Australia. During this conversation, the friend – attuned to their annoyance – shares a story of how in their travels, they attended a talk by a young philosopher who was exploring the potentials of chess situated as a crafted endeavour. Having never considered chess as a craft, the feeling of annoyance slowly gives way to that of inquisition, and upon leaving the conversation, the person happens to spend most of the bus ride pondering what this could mean for their next game in the park – scribbling questions in their notebook. Arriving at the seminar, they begin to listen to the presenter who is discussing the non-intellectualist foundations of ecological psychology. Pertinently, one of the questions scribbled in their notebook relates to what chess as a crafted endeavour would mean for its pervasive mentalistic grounding, and as such, this unfolding presentation starts to draw their attention toward interesting threads that could guide their response. Not only does this lead them to note down the texts cited by the presenter in their notebook, ready to be followed up at a later date, but following the seminar, it encourages them to share with the presenter some of their questions about chess as a crafted endeavour. This opens a correspondence that carries on beyond the lecture theatre, flowing into the bar later that evening.

What this example attempts to demonstrate is that the experiences one undergoes in the doing of various things – be that playing chess, conversing with a friend, riding a bus, or attending a

research seminar – *always overflow*. As eloquently noted by Bergson in the quote with which this section began, it is the continuous progress of the past which gnaws into the future. For if it did not, there would never be anything but the present, no spilling over of experiences undergone into the doing of the actual. To be sure, chess – even as a crafted endeavour – does indeed have moments of rest. After all, the person in our example lost *that* game. Our contention, though, is that these moments of rest are not endings, not at least in a terminal sense. Rather, they are moments of inhalation, a taking-in of the experience undergone, to be cast it out in exhalation toward the next doing. Chess games, thus, carry on.

5. Epilogue: of weaving string bags and chess games

Positioned as a game players make their way through, our aim was to explore the relation between thinking and making in the context of chess. Following Ingold (2013), we explored this through two distinct voices; the theorist and craftsperson. Opening with the former, chess was grounded in an intellectualist tradition, in which the form of game-play is seen to arise from superior computations that go on in the mind of a player *before* a move has been made. This, we suggested, is to *make through thinking*, and imbues a static, close-ended and dematerialised conception of chess. Foregrounding our departure from this intellectualist tradition, we next sought to bring about a sense of chess that exceeded the squarely defined locus of the game. This led us to speak in the voice of a craftsperson, and ground game-play in tenets of Gibson's (1979/2014) ecological approach to psychology and Ingold's (2013) perspectives of making. As an ecological phenomenon, the unfolding form of a game can be attributed to the attuned responsiveness of players who join with the games coming-into-being, anticipating a way forward by looking, along with listening and feeling. This, we suggested, is to put thinking not ahead of making, *but in its midst*. In rounding out our conception of chess spoken in the voice of the craftsperson, we explored its attentive, corresponsive and temporal characteristics.

There is, however, one last thread we would like to cast out as our paper comes to a pause, drawing yet again on the inspiring work of Tim Ingold. In his magnum opus, *The Perception of the Environment*, Ingold (2000, ch. 19) explores the craft of *weaving*. Thinking with the Telefol people of central New Guinea, Ingold shows how the form of a *bilum* (string bag) unfolds through the light-handedness of a craftsperson responsively attuned to the nuances of the materials with which they weave:

> […] the accomplished *bilum*-maker does not experience the movements of her body as being of a mechanical nature. Far from answering to commands issued from a higher source, they carry their own intentionality unfolding in a continual dialogue with the material. Telefol people liken this movement to the flowing water of a river … However, in order to maintain the evenness of the string, in spinning, or of the weave, in looping, it is necessary to make continual adjustments in the course of the movement itself. (Ingold, 2000, p. 355/6)

This excerpt draws resonance between the way *bilum*-makers spin, loop and weave their bags, and the way chess-craftsperson's make their way through the ebbs and flows of a game. Far from answering to representations pre-arranged in the mind of a master player, the chess-craftsperson – much like that of the *bilum*-maker – attentively feels their way forward, corresponding with the games coming-into-being. In making their way through the game, they leave not the mechanical imposition of preceding thought, but like a *bilum*-maker, they weave a path that flows along in continual response to changes in environing conditions, both on and off the board. Herein lies our last thread: as a crafted endeavour, perhaps we could consider chess as a *practice of weaving*, in which thinking unfolds with the spins and loops of the games coming-into- and out-of- being.

Notes

1. For an overview to well-defined tasks in domains such as reading, see Trasmundi et al. (2023).

2. We borrow this phrase from Otto Selz's Denkpsychologie, which was a central reference for de Groot (see Frijda & de Groot, 1981).
3. Although Holding (1992) precisely advocates the primacy of 'process' over 'projection' and, on this point, establishes proximity to the present writing, as will be argued, the thought process is not – as the SEEK model presupposes – reducible to calculation and prediction, and, crucially, is not enclosed inside the skull.
4. For an overview as to the various debates surrounding the concept of affordance within the field of ecological psychology, see Chemero (2009, ch. 7).
5. Dewey drew inspiration from William James who compared the course of a conscious experience to the flight and perching of a bird. Both flights and perchings, James contended, are intimately connected; a place of rest is an undergoing in which the consequences of a prior flight are absorbed and carried on to the next perching.

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